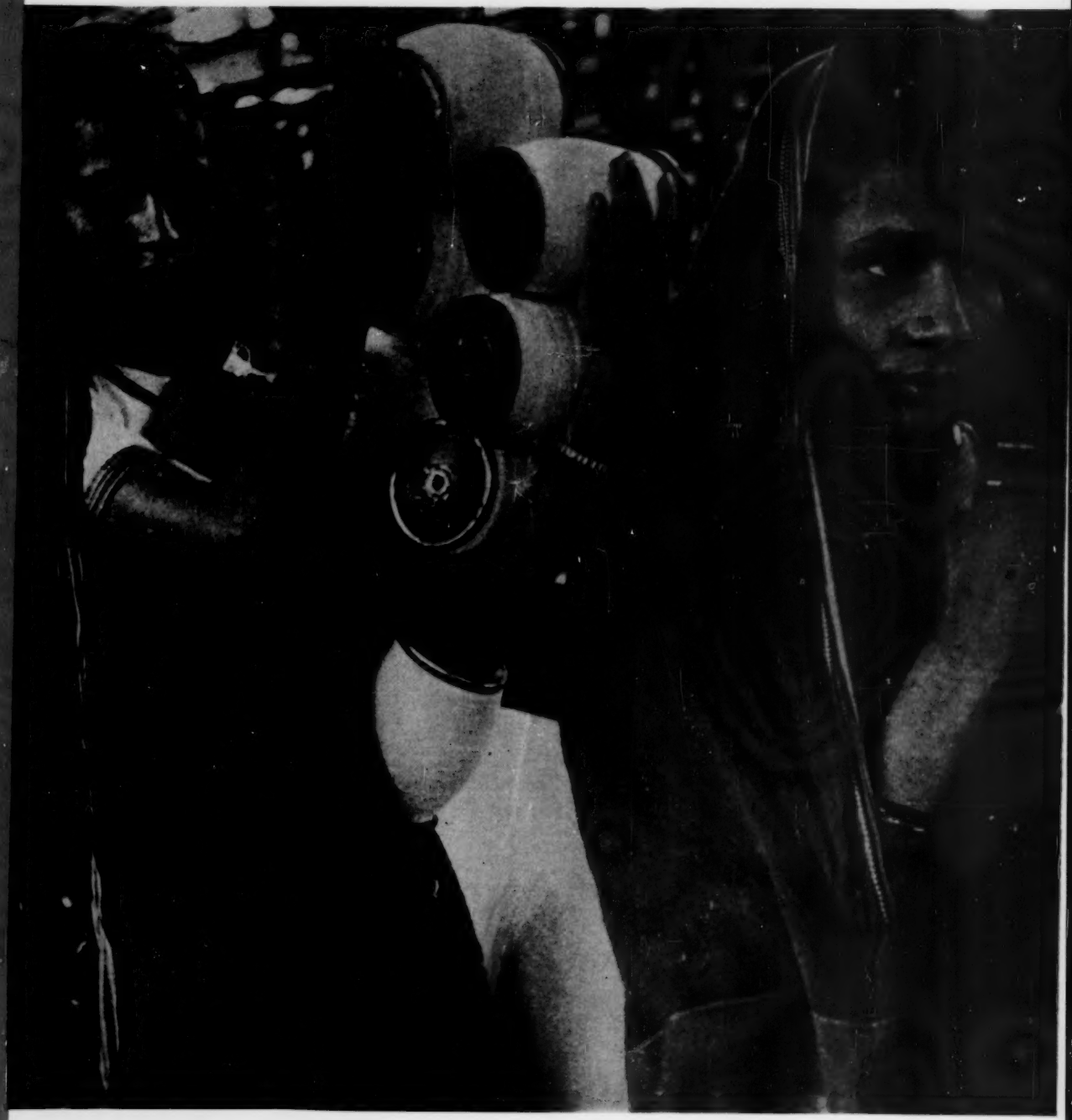
the magazine of STANDARDS



planned standardization . . . page 292

OCTOBER 1960

the magazine of STANDARDS

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

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Ruth E. Mason, *Editor*
Margaret Lovely, *Art and Production Editor*

ASA

THE COVER: In this issue, the director of India's standards association describes the association's work as it relates to India's developing industries. This picture was taken in the largest textile mill in Bombay. The girl workers, in typical Indian dress, support the load of bobbins they carry by propping a bobbin under an elbow.

Photo: Government of India Information Services.

notes

• One question lies close to the surface in the mind of everyone concerned with standards: "How can we convince the comptroller that a standards program pays?" One answer to this question, presented at this year's Company Member Conference Spring Meeting, is to be next in the series on company standards programs (see the November issue).

Another approach to the problem is represented by the two-part paper starting in this issue (page 304). Although entitled "Reducing Item Varieties," this article presents an unusual philosophy on how to sell the company's standards program not only to those who control the purse strings, but also to those responsible for making use of the standards developed.

• Years of quiet but effective service were rewarded this past month when Cyril Ainsworth received one of the first Awards of Merit presented by the U.S. Department of Labor (page 312). The citation mentioned Mr Ainsworth's contributions particularly in connection with American Standard safety codes.

Old-fashioned slips, falls, and materials-handling accidents may not be as exciting as some of the more dramatic dangers of the modern Space Age but, the U.S. Department of Labor has reported, they still rank as the chief causes of work injuries. Mr Ainsworth's work has been aimed toward reducing such everyday hazards.

Inadequate lighting, for example, causes from 15 to 25 percent of these old-fashioned industrial injuries. The Department of Labor has urged that the American Standard Practice for Industrial Lighting be put to work to help prevent them. Many other American Standards are also helping to cut industry's accident toll.

The American Standards Association notes with pride the Department of Labor's recognition of Mr Ainsworth's services to industrial safety.

This Month's Standards Personality

George F. Habach

A STRONG SENSE OF PURPOSE in advancing the use of standards is one of George F. Habach's special characteristics. Mr Habach, who recently was advanced to the position of vice-president in charge of administration of the Worthington Corporation, has been active in work on American Standards since 1938 and has been chairman of the important Sectional Committee B5, Small Tools and Machine Tool Elements, since 1955. Mr Habach has had a part in developing American Standards for graphical symbols, letter symbols, and abbreviations, and is at present a member of the committee on gears. For his exceptional interest and work in standards, Mr Habach was awarded the grade of Fellow in 1956 by the Standards Engineers Society and is serving on the Society's Research and Education Committee.

Upon his graduation from Stevens Institute of Technology with the degree of M.E. in 1929, Mr Habach was employed by Worthington Corporation, which rates as one of the world's leading manufacturers of a highly diversified line of capital goods equipment and machinery. At the same time, he continued his interest in education and obtained his master's in mechanical engineering from Polytechnic Institute of Brooklyn in 1936. His recent rise to vice-president in charge of administration followed service with Worthington as design engineer, application engineer, development engineer, chief engineer, engineering manager of the company's Harrison, N.J., division, and vice-president of engineering for the corporation. He is also a director of the Electric Machinery Manufacturing Company, Milwaukee. A man who is well aware of the importance of higher education to the world today, Mr Habach was elected president of the Worthington Foundation early this year.

Mr Habach is a lecturer and writer on management, education, and standardization. He also holds a number of patents.

Member of the National Society for the Promotion of Education, the Standards Engineers Society, Pi Tau Sigma, the Hydraulic Institute, American Management Association, and others, he is a member of the Advisory Committee for the Division on Tools of the American Society of Mechanical Engineers and is chairman of the ASME Medals Committee. He is also a member of the Executive Committee of the North Jersey Section of ASME.

Education and community affairs are among Mr Habach's special interests. He taught an advanced course on pumping machinery for some ten years in the evening graduate school of the Polytechnic Institute, and is chairman of the Polytechnic Alumni Fund Council. The fund has exceeded its goal for the past two years.

Mr Habach is married and father of an active teen-age daughter. His favorite leisure time activities include music, gardening, and reading, in addition to enjoyment of his family and home.

PLANNED STANDARDIZATION FOR A PLANNED ECONOMY

THE INDIAN STANDARDS INSTITUTION is host to the International Electrotechnical Commission this year. The IEC General Meeting, to be held at New Delhi, October 30 - November 12, is featuring meetings of 21 technical committees and subcommittees, in addition to the Committee of Action, the IEC governing body. Dr S. Radhakrishnan, vice-president of India, is opening the meeting. The Union Minister for Commerce and Industry, president of the Indian Standards Institution, will welcome the delegates at a reception. Visits to establishments of outstanding technical interest, as well as a number of special events for the entertainment of the delegates, have been scheduled. Twenty-five delegates are to represent the USA at the IEC meetings.

Factory testing of meters used in supply of household electrical energy.

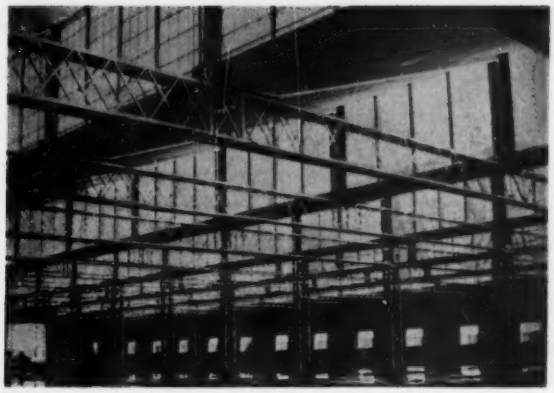
The role of standards in free India

by Dr Lal C. Verman

Lathes under inspection at a public sector machine tool factory.

THOUGH THE HISTORY of standardization in its modern form in India can be traced back to the early period of the First World War, yet the organized effort in this field was initiated as late as 1947, when India became independent and began to think in terms of large-scale industrialization as a means of raising the standard of living of her people. It was during this year that the Indian Standards Institution came into being and assumed responsibility for preparing standards and promoting their widespread use in all walks of the nation's economic life, including industry, agriculture, and trade. In the newly liberated country where people looked forward to the future with enthusiasm and hope, it was not a difficult matter to sell the idea of standardization as a means for securing orderly growth of human activity in all its various phases. Engineers, technologists, and scientists needed little convincing; industrialists and administrators soon realized the gains to be expected; trading and commercial interests began to appreciate how far the effectiveness of their services depended on standards; consumers, though unorganized and therefore inarticulate, intuitively felt that they stood to gain the most from standardization, once it really took root in the country.

During the first few years, while ISI was engaged in organizing its basic structure and elaborating its procedures, the country was engaged in settling its displaced millions and attending to other immediate problems resulting from the partition of the country. It was only in 1950, when development programs began to be formulated in an organized manner, that



A light-gage welded steel structure for an automobile workshop designed and constructed in accordance with the Indian Standard Design Codes. The saving in steel over the conventional design in this case is estimated at 33 percent.

ISI prepared its own Five-Year Plan and had it adopted as a part of the National Plan. It became apparent that standards were going to play their expected role in shaping the future of the country and in contributing to an orderly development of industry. Although the country was not starting from scratch with a slate clean enough to write whatever one wished, the then-existing state of development represented merely a small fraction of the needs of the country; therefore, any standardization that had existed at the time could not be regarded as being so firmly entrenched as to be difficult of re-channelization.

Most of the official purchase specifications and standards were in need of revision after the war and the Government of India wisely adopted the policy that, wherever an Indian Standard issued by ISI was available, it must replace the corresponding official standard for procurement and other purchases. ISI thus came to serve in a major way both public and private sectors of industry and trade.

Metric System

For any program of standardization to succeed, it was essential that the basis of all standardization be rationalized; in other words, the multifarious existing systems of weights and measures had to be unified, rationalized, or replaced. By the close of 1949, ISI had completed a country-wide survey on this basic question and presented an authoritative report to the Government of India, recommending the adoption of the metric system in place of the several systems that were current in different sectors of industry and trade and in different parts of the country. After five

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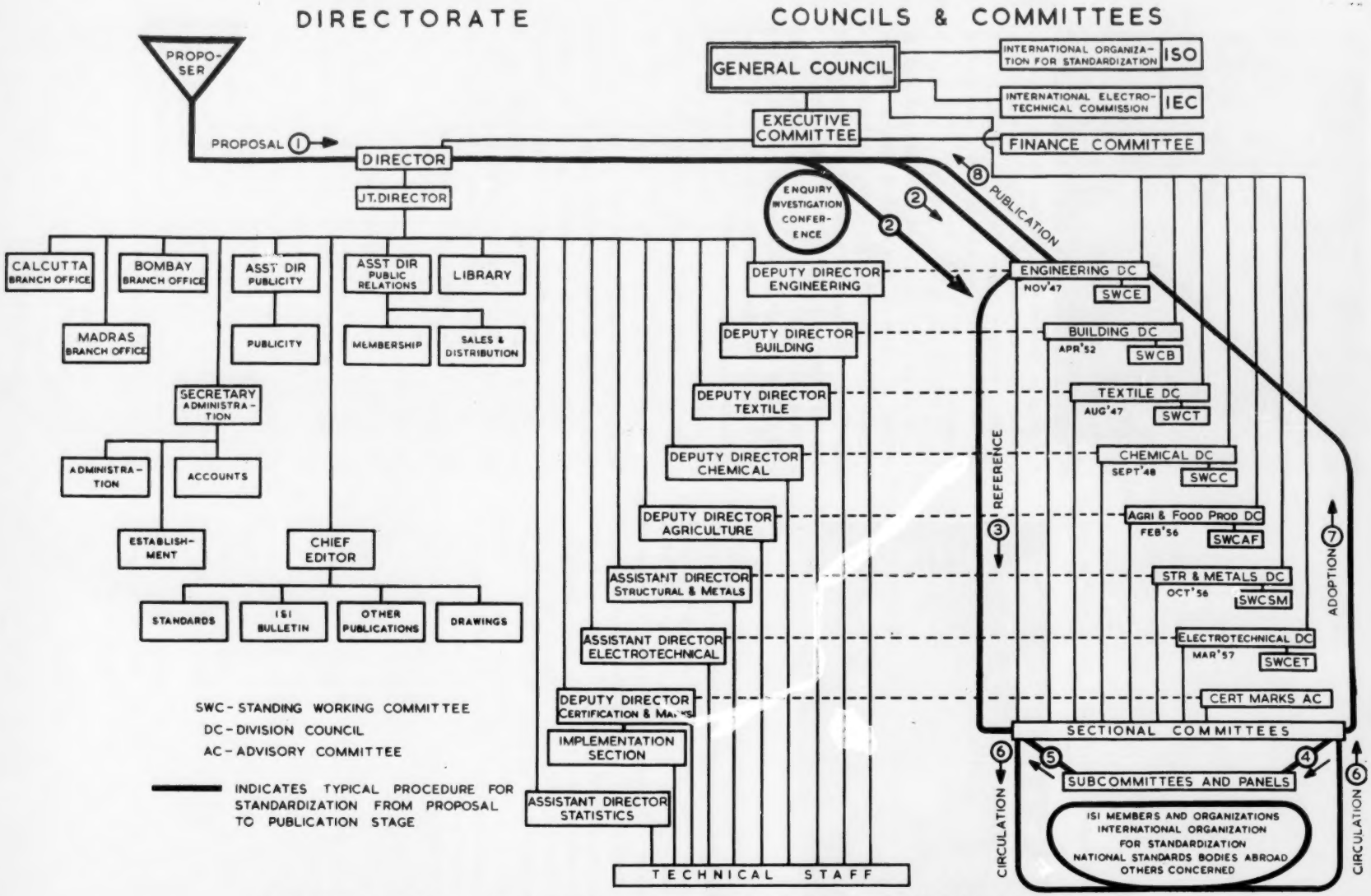
DR VERMAN is director of the Indian Standards Institution, New Delhi. He served as vice-president of the International Organization for Standardization from 1952 through 1955.



Organization chart of the Indian Standards Institution; to the left the Directorate staff, and to the right Council and committee structure, with horizontal dotted lines indicating staff-committee relationship. Heavy full line shows a typical case depicting procedure for preparing Indian Standards.

continuous years of consideration, the Government finally accepted the principle, and in 1956 the necessary legislation was adopted. This envisaged a 10-year period of changeover. While the statutory and administrative responsibility for the changeover resides entirely with the Government, ISI has the task not only of amending all its standards and formulating new ones in metric terms, but also of ensuring that the introduction of new standards in no way interferes with the existing production nor hinders the speedy growth of new industries which is the goal of our national planning.

Designers and construction engineers and many others have to re-orient their thinking processes in terms of the new system. This perhaps is the most difficult task. It is imperative, therefore, that the new generation of engineers and technologists now under training be provided with appropriate handbooks and their teachers given adequate guidance so that the various curricula can be suitably converted. Towards this end ISI is publishing several guides, handbooks, and codes. Nevertheless, at least a generation must elapse before metric thinking may be expected to become common among engineers and technologists. The Indian people today are firmly convinced that, considering the enormous economic and technological advantages to be gained, the colossal national effort involved is well worth-while, and since conversion is being attempted at the early stages of our large-scale industrialization, its costs will be hardly more than nominal.

Steel Project

It was also in the early 'fifties that ISI began planning its steel economy project – a comprehensive program of standardization aimed at conserving this basic material at all stages, including manufacture, design, fabrication, construction, and maintenance. The redesign of hot-rolled structural sections, which was also being attempted at about the same time in the European Iron and Steel Community, formed an important part of the ISI project. The series of sections now standardized by ISI are based on a 25-mm module which was chosen largely because of our inch association – both past and present. These sections are about 10 percent more economical in material, being that much lighter, without loss of strength. Then, again, design codes have been thoroughly revised and factors of safety liberalized. These steps are likely to lead to further economy of about 10 percent. The light-gage cold-formed sections are also being standardized, to the extent they can be, on a national plane and the design code for their use has been published. It is well known that light-gage structures are highly economical, effecting a saving of up to 40 percent of steel, if not of cost. Their widespread use in tropical countries, however, depends a great deal on the effectiveness of the measures adopted for corrosion prevention. For the preparation of suitable codes of practice for the maintenance of light-gage structures, it has been found necessary for ISI to organize a comprehensive program of research through a network of test stations in different parts of the country for the study of the effects of varying conditions of exposure and use for improving the existing procedures for anti-corrosion treatments. Welding makes an important contribution to the saving of steel, and the many standards concerned with welding practice, materials, and equipment that are required are being processed as expeditiously as practicable.

Apart from the structural field, there is well recognized need for standardization of types and varieties of different steels and for reducing their number. Indian industry, having imported in the past and still continuing to import machinery, equipment, and know-how from all parts of the world, has always demanded special, alloy, and tool steels based on all sorts of overseas national specifications. Thus we have definite need for SAE and AISI steels of USA, EN steels of UK, ST steels of Germany, and many others, and the quantities involved of each type and variety are naturally small. It is obvious that while any one of these national series would be quite adequate to meet the need of the particular nation concerned, yet a country like India, launched as it is on a comprehensive series of plans for its development, would find the current position highly wasteful. ISI, therefore, has currently under preparation the publication of schedules of special, alloy, and tool steels, which, while catering to the present needs, also attempt to cover our future requirements. A code of designation is also being attempted.

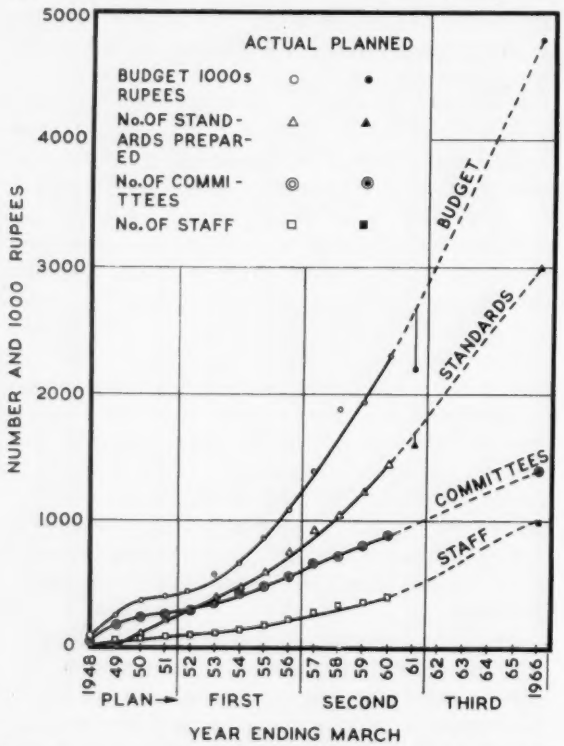
At the time ISI initiated the steel economy project, India was producing a little over one million tons of finished steel; through the second and third five-year plan effort this is expected to reach over 10 million tons in 1965-66 – a ten-fold increase in ten years. The new mills both in the public and private sectors have already begun to produce the new Indian Standard series of structural sections, and gradually the older mills will also be converted as the demand for old sections dwindles. Design and welding codes are already being actively followed, while training, testing, and certifying of welders is being organized in collaboration with specialist organizations. The alloy, special, and tool steels which are now being produced in driblets are planned to reach the 200,000-ton mark by 1965-66. The plans now being made for the production of these steels envisage that only the varieties included in the Indian Standard schedules will be manufactured.

It may also be mentioned that in 1956 the Economic Commission for Latin America had the opportunity of examining the ISI project when it decided that a similar project would be useful for the Latin American countries. It is now understood that the Latin American Institute for Iron and Steel is expected to undertake the task in the not too distant future. British

Commonwealth countries have also exhibited a great deal of interest, particularly in the ISI redesigned hot-rolled sections. Time is perhaps ripe for undertaking such work at the international level, before too many rather efficient series of sections become standardized in different countries and create new problems of co-ordination.

Timing of Standards

The question has often been asked as to what is the most suitable time for standardizing in relation to the development of an industry. For example, is it advisable to prepare all standards before an industry is created so that its development may be properly guided, or is it desirable to wait until adequate experience in production and utilization is available to guide the preparation of reasonably sound and practical standards? In between these two extremes, there could be many other approaches, and perhaps one of these latter approaches dictated by the particular circumstances of a given case may be the right answer. In India, questions like these arise perhaps even more often than in more advanced industrial countries. So many new industries are to be set up, and although only a few of these are new to the industrial world, yet even those for which know-how is readily available need necessarily depend upon sources of raw material peculiar to India. Climatic factors and even socio-economic variables often influence the pattern of development of an industry. Thus, standardization in the field of industries, otherwise well-developed elsewhere, may present peculiar problems when it is to be carried out in the Indian context.



Year-by-year growth of ISI staff, committee, standards, and budget since its creation; actual statistics for the first and second five-year plan periods and goals for the third plan.

ISI is thus often faced with the question whether the time is ripe to take up a project or whether it would be desirable to let a period of time elapse for industry to take some sort of shape. Whatever decision may be taken, the objective is to afford the maximum facility for industry to establish itself firmly, and once it is established to ensure that it becomes an organic part of an ordered whole. It was this policy that led ISI to launch the steel project long before large-scale development of the steel industry got under way. ISI was obliged to prepare a standard on blast-furnace slag cement when not an ounce of the material was being produced in the country, yet this standard led the way to the establishment of a new industry which produces a valuable commodity out of a waste product, the disposal of which had itself been a problem.

Sometimes the time for standardization is dictated by the pace of development of international recommendations. India, having decided to go metric and having continued inch ties, has, perhaps more than any other country, to look to international standards to guide the course of its own action. It often happens that international decisions side-track the main question of world standardization by simply recognizing two series of dimensions – one inch-based, one metric-based, as, for example, in the very important case of screw threads. India had waited a long time in the expectation that a unitary thread series, which many countries, including India, advocated, would find favor. This series had technical merits besides representing a truly international standard, making interchange of threaded fasteners possible on a world-wide basis. Yet it lost by a very narrow margin when put to vote. In India's view, voting in such cases is hardly justified; what is required is persuasive, convincing, and friendly give-and-take in the interest of a common cause. It is appreciated that idealism and sentiment have no place in the game of standardization, nor should personal preferences and parochial considerations be permitted to take the upper hand. Anyway, Indian Standards on screw threads had to await the international decision before they could be issued, and naturally they had to be based on the ISO metric series, though India's own preference was for a unitary world series.

IEC and Electrical Standards

In other cases, the ISI approach to international unification of standards has met with better success; for example, the International Electrotechnical Commission (IEC) welcomed the idea of unitary standards for dimensions for electric motors. Incidentally, for the first time in its life, IEC is holding its annual general

meeting outside of Europe and North America, that is, in New Delhi. ISI will soon have the privilege of receiving standards engineers from all over the world and of showing them something of India's effort at making electrical energy and the resulting amenities available to the remotest villages. At the beginning of the first planning period (1950-51) India had an installed capacity of 1.7 million kw which rose to 2.7 million kw at the end of the first five-year plan. Before the second plan period ends in 1960-61, the installed capacity is expected to reach 5.8 million kw, with the third plan target being set at 11.8 million kw – a seven-fold increase in 15 years. It is with this background that ISI is expected to set its pace for standardization in the electrotechnical field, indeed in all other fields as well, for electrical energy is the basic requirement of all industries, and for some it is truly considered a raw material.

Company Standards

Starting with an almost clean slate in a new country, as ISI did, also has its drawbacks. For example, when ISI opened its doors in 1947, very few companies and even fewer industrial and professional organizations had any standardization activity of their own in their particular spheres. Even now, in 1960, the situation is not much better. The result is that ISI is often asked to prepare standards which ordinarily should be the concern of a company; for example, standards for bicycle parts, sewing machine components, cane-crushing machines, and so forth. ISI has all along resisted the pressure for preparing design standards of this character on the ground that the spheres of national and company standardization have quite distinct objectives and that it would be hardly reasonable to freeze on a national plane the designs of bicycles or sewing machines. Similarly, the absence of any active consumers' organization has been a handicap. Though more recently a Consumers Association of India has come into being at the initiative of ISI, it has still to gather momentum before it becomes effective. Indeed, a great deal of effort is called for to get companies and organizations to initiate standards activity of their own, which is a necessary prerequisite for the success of the national effort on which depends the success of our national planning.

ISI Plans

As mentioned earlier, parallel to the National Plans, ISI has been preparing and following its own five-year plans. The second of these plans terminates in 1960-61 and some of its goals have already been achieved or surpassed. The third plan, starting from the next fiscal year, provides for ISI to double its present activities in all its departments including the certification marks. Although estimates based on all the available statistical data have indicated that a three-fold expansion of ISI would perhaps be necessary if most of the anticipated demand on ISI services were to be met, yet such an expansion in five years could hardly be planned for, particularly in the face of the prevailing dearth of experienced engineers and technologists in the country. It is also important to bear in mind that expansion and consolidation should go hand in hand if healthy growth of an organization is to be ensured – especially an organization which depends for its effectiveness on the voluntary co-operation of so many interests – both in the public and private sectors.

RECENT DEVELOPMENTS IN EUROPE

NEW DEVELOPMENTS pointing to greater use of IEC and ISO procedures will be of special interest to U.S. industry concerned with international trade. The national standards organizations of the European Common Market countries and the European Free Trade Association[1] have taken action to coordinate their national standards and eliminate differing standards that may hinder trade and nullify or reduce the benefits of lower tariff barriers. The European Common Market countries had already taken measures to accept recommendations of the International Organization for Standardization and the International Electrotechnical Commission. The present move extends this collaboration to both groups.

Joint committees are being set up to deal with electrical subjects (handled by IEC and CEE[2]), and nonelectrical subjects (handled by ISO). The Association Francaise de Normalisation, the French national standardizing body, has been assigned the secretariat for these joint committees. The work will be kept as far as possible within the framework of ISO, IEC, and CEE, the British Standards Institution reports, since this is not an attempt to create new international standards or recommendations on a regional basis.

[1] The European Common Market countries (known popularly as the Inner Six): France, West Germany, Italy, Belgium, Luxembourg, Netherlands; the European Free Trade Association (known popularly as the Outer Seven): Austria, Denmark, Norway, Portugal, Sweden, Switzerland, United Kingdom.

[2] CEE—International Commission on Rules for the Approval of Electrical Equipment.

ABOUT THE IEC

by VIRGIL GRAHAM

THE INTERNATIONAL Electrotechnical Commission (IEC) handles the electrical and electronic work in the field of international standardization recommendations. It should be noted that in many countries IEC recommendations come to have the force of law, which can seriously affect USA interests in foreign countries not only in imports but also in cases where USA companies have licensees or subsidiaries overseas. This makes it important that standards in those countries be compatible with those in the USA. These aspects, of course, are increasing tremendously and require extremely active participation to protect USA positions and interests. Additionally, there recently has been a great deal of interest on the part of NATO in IEC activities, particularly in the field of semiconductor devices. There seems little doubt that the interest of NATO in IEC will spread to the Armed Services.

Thirty-six countries presently have membership in IEC through their respective national committees. The nature of these varies; some national committees are governmental bodies, some are quasi-governmental, and some, as in the case of the USA, are supported by industry. The U.S. National Committee is a creature of the American Standards Association and consists of most of the members of the ASA Electrical Standards Board with a few members-at-large.

The technical work of the IEC is handled through technical committees, presently numbering 46, under the over-all supervision of a Committee of Action which reports to a Council. The technical committees are comprised of representatives of the national committees interested in the particular scopes and in sending representatives to the meetings. Some technical committees meet annually and some less frequently, depending on the nature and pressure of the work.

A meeting of a technical committee will discuss documents in its scope which have been generated by national committees. Such discussion usually leads to material which the committee secretariat will work into a "secretariat" document for consideration and comment by the national committees during a between-meeting interval. Such comment and discussion at the following meeting can result in offering a proposal which, when accepted by the Committee of Action, will become a "central office" document put out under the "six months' rule." This is a letter ballot of the national committees. Minor changes in the document during or after the six months voting period can be put out under a "two months' rule." After approval by the national committees, the material is issued as international recommendations in an "IEC Document."

MR GRAHAM is associate director of the Engineering Department, Electronic Industries Association. He has been vice-president of the United States National Committee of the IEC since 1955, and is a technical advisor to the USNC on a number of IEC technical committees. He is chairman of the IEC committee on semiconductors.

The importance of the IEC work to U.S. industry was the subject of comment by *Electronics,* July 3, 1959, which said:

"In the opinion of industry observers close to the IEC, there are three main reasons why American electronics firms should be paying close attention to the work of IEC subcommittees concerned with electronic components and equipment.

"1. A meeting of heads of national committees represented in the IEC indicated last April in Paris that technical information regarding standards will be made more available to underdeveloped countries.

"U.S. observers feel it is a certainty these nations will be substantially guided by the electronics standards of the IEC. Since these countries represent a burgeoning market for all kinds of electronic equipment, they feel the U.S. electronics industry must be strongly represented in standards deliberations to avoid being out of step and losing trade.

"2. The six nations of the European Common Market said they will stick as closely as possible to IEC standards.

"3. The North Atlantic Treaty Organization tends to pick up IEC standards when specifying military electronic equipment. Observers think the trend will become more pronounced.

"For more than 50 years the IEC has coordinated and unified national electrical and electronics standards by drawing up recommendations upon which the standards bodies of the member nations might base their own standards."

E. S. Geary addresses workshop at CMC Spring Meeting.

STANDARDIZATION OF SHOP PRACTICES

by E. S. GEARY

THE TERM "standardization" is commonly associated with materials, parts, weights, measures, tolerances, and similar characteristics. There is another area, however, in which standardization is perhaps widely used without being recognized. That is the area of "standardization of shop practices" – that field of endeavor between the drawing and the final product, involving the application of human skills, the selection and use of assembly tools, and general know-how, much of which is in the minds of men rather than in written instructions. The specific field

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MR GEARY is senior engineer at the Kearney N. J., works of the Western Electric Company. This third paper in the series on specific phases of a company standards program was presented by Mr Geary at the Spring Meeting of ASA's Company Member Conference in Philadelphia, May 2 and 3, 1960.

An introduction to the series by Philip Callan, Eastman Kodak Company, was published in the July issue (page 207). The first article in the series, on problems of starting a standards program, by Ernest E. Mohr, appeared in the August issue (page 238), followed by an article on the company's standards manual, by Philip H. Goeltz, in the September issue (page 268).

with which I have been associated is in standardization of shop practices concerned with the assembly and wiring of telephone apparatus and equipment.

Large industry, especially where the skills of human effort contribute the greatest part of the manufacturing processes, must appreciate that standardization of shop practices does exist in its plants, at least to some degree, even though such standards may be unwritten. Without this standardization in manufacturing methods, today's products could not be maintained at the high-quality standard which is cherished by a company. Small industry, also, would do well to recognize the benefits to be derived from standardization of shop practices. These benefits all point directly or indirectly to a reduction of manufacturing costs and improved and consistent product quality.

Although it is the intention to outline here the nature of the problems a standards engineer encounters, it is equally important that the *benefits* of this type of standardization program be highlighted. Therefore, let us first consider in some detail the benefits of this area of standardization which have an effect on manufacturing costs and improved product quality.

(1) Uniform shop practices promote standardization of training for new personnel:

With the standardization of those shop practices which are common to many products and many different shop departments within the plant, it becomes possible to centralize basic training of new personnel, particularly in large industry where there is a constant turnover of employees requiring hand skills. If centralized training is not used, then the basic training by individual shop instructors will at least have a basis for uniformity.

(2) Uniform practices promote transferable skills:

This benefit is very important, considering the difficulties encountered when shop workers must be shifted within the plant to meet the needs of the business. This is particularly important when it is necessary to maintain flexibility to suit the schedules of products that fluctuate in demand. In short, it provides the possibility of borrowing skills from other departments to meet sudden rises in certain product demands and, conversely, to loan out these skills as conditions permit. Without standardization, fluctuating product demands calling for temporary borrowing of workers can incur considerable cost and lost productivity resulting from retraining of personnel.

(3) Uniform practices promote improved and consistent product quality:

Uniform practices and uniform quality go hand in hand. Consider the inspector's capability in passing judgment on a product which is not uniform in appearance or workmanship because of nonuniformity in the hand skills that were employed in manufacturing. The inspector thinks: "They can't all be bad; but which do I consider good and which do I use as a yardstick for gaging all others?" Standardization of shop practices also goes a long way in separating personal opinions from good judgment.

(4) Uniform shop practices promote standardization of product design:

Product design which does not take manufacturing processes into consideration is not the best product design. The importance of uniform shop practices cannot be too highly stressed as influential to product design. The designer must of necessity create a product that can be manufactured, insofar as practicable, with processes requiring the least amount of special skill and machinery consistent with the value of the product. His job can become very frustrating when he creates a design to suit the capabilities of one department today and then has to create differently tomorrow when designing a product for another department engaged in manufacturing essentially the same type of product. A simple example would be the method of routing and dressing the wires from a cable harness to component apparatus terminals in wired equipment. Without a standard method of routing these wires, the designer is lost when trying to determine the proper length required for wires breaking out of the harness. In the long run, standardization of shop practices spares the designer a tremendous amount of repetitious detailing on the equipment-assembly drawings.

(5) Uniform shop practices promote standardization of manufacturing requirements and tolerances:

Let us remember at this time that all of the manufacturing tolerances and requirements do not come from the National Bureau of Standards, the American Standards Association, and other standards organizations. Each product will have requirements and tolerances to be built in as dictated by the design and the manufacturing processes involved. The question here is, "which comes first: the requirements and tolerances, or the manufacturing processes?" This is almost as disputable as the age-old question of "which came first: the chicken or the egg?" This also becomes one of the standards engineer's problems.

(6) Uniform shop practices promote one set of rules that can be applied over a variety of products requiring the same basic or common operations:

This is especially beneficial when compared to the practice of creating individual shop layouts or instructions for each new and different code of similar equipment manufactured. Once a set of standard practices is established, the individual product planning engineer need only be concerned with special skills, special facilities, special operations, and special product requirements and tolerances, all of which can be covered in supplementary instructions in addition to or superseding the standards.

So much for the reasons why a program of standardization of shop practices will benefit you and your company. Let us dwell for a few moments on the problems an engineer will encounter while set-

ting up and maintaining a program of shop practice standards.

Probably one of the greatest obstacles an engineer must overcome while setting up a shop standards program is that of conflicting personalities, opinions, judgment, and ultimate goals when dealing with the multitude of people who initially or eventually become involved. His problem here becomes one of gaining the respect of the people with whom he deals and particularly those who will be affected by the results of his work. This is not an easy task when you consider that the results of the initial standards program will fall like a cloud of radioactive dust on the heads of personnel, including design engineers, planning engineers, wage incentive engineers, quality assurance engineers, inspectors, and operators, right down to a teen-age boy or girl fresh out of school performing an operation as simple as driving a screw. Let us not forget that even the shop foreman and upper management will also feel the effects of a standards program which may initially upset their long-standing routines and uncommon practices.

To overcome this problem the engineer assigned must be one who is well known by the shop people and other engineering organizations—preferably someone who has an appreciable amount of service with the company and has already gained respect concerning his wisdom in making decisions. To set up and maintain a standards program requires the teamwork of design, product planning, and standards engineers in establishing the initial set of common requirements and methods, and also when major revisions are involved.

Another problem to be considered has already been mentioned under benefit (5), which asks: "Which comes first in standardization of shop practices: the requirements and tolerances, or the manufacturing processes?" The answer to our question could be this: If you already have established the manufacturing requirements and tolerances, you will set forth to develop uniform or common shop practices to produce to these limits and revise those requirements and tolerances which can only be met by special skills at higher cost, unless the product demands special consideration. On the other hand, if no standard program of requirements and tolerances has yet been established, it would be well to standardize on the manufacturing processes and shop practices along with an initial set of requirements, both subject to revision until the bugs are worked out.

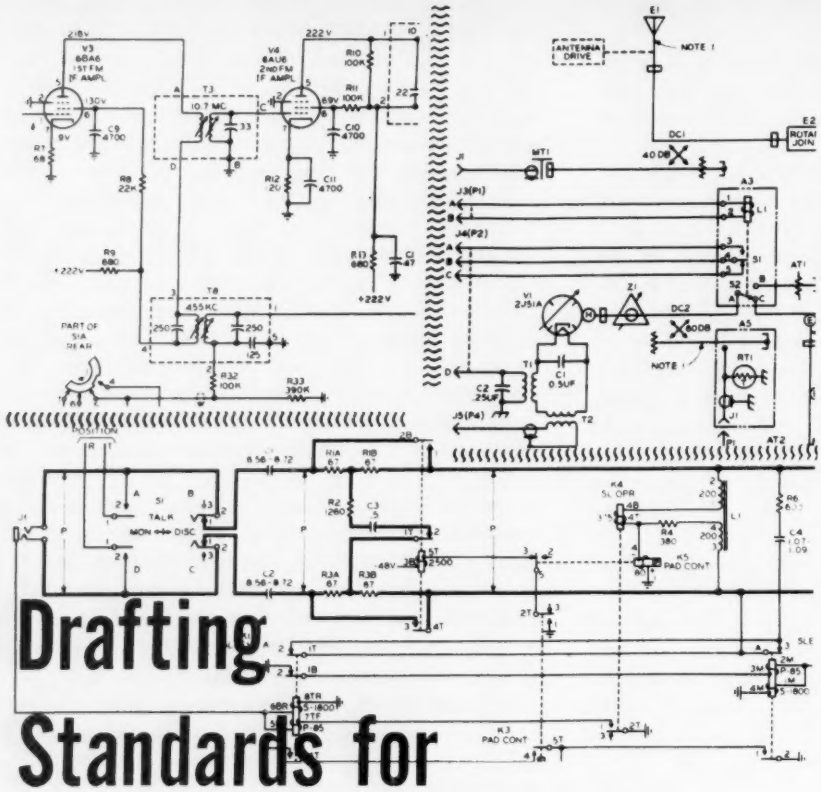
Next comes the problem of decision-making with respect to the shop practices to be standardized. Obviously, a line must be drawn as to where a manufacturing operation is common or uncommon. A basic knowledge of the plant's total variety of products is required by the standards engineer, and the size of the initial bite that is chosen to be affected by standardization may have a telling effect on the success of the program. The problem of decision-making also involves setting up the common requirements and tolerances which it will be practicable to meet under guides set forth by the methods to be established as standard. Perhaps here is where a standards engineer must exercise his most valuable talents; for here he demonstrates that standardization is a science of practicality and common sense.

To decide the operations to be standardized requires an engineer who not only is familiar with the plant's total variety of product but is also dexterous enough to perform the operations which are to be considered as standard methods or practices. This dexterity must be sufficient to make him capable of performing the operations under actual shop conditions and to meet the requirements expected.

Selection of the format in which the shop practices, common facilities, common requirements, and tolerances are to be written and published, and of those to whom they shall be made available is another aspect of the problem. Mr Goeltz has already covered this phase and the many problems that are associated with it in his article on "Standards Manuals" (Mag of Stds, Sept 1960, p 268). It is important to remember, however, that because of the speed with which advancements are being made today in development of new products, redesign of the old products and changes in manufacturing techniques, the ability to make rapid revisions and distribution becomes extremely important. We at Western Electric Company have successfully used the handbook form, providing separate books for each operation, broken down into various phases and including specific sections to cover special requirements and methods for individual products or equipment shops. These specific sections permit the product planning engineer to cover those requirements and methods that are peculiar to his product.

After a program of shop standards is put into effect, then comes the shop standards engineer's eternal problem of constantly being called upon by various people affected, to referee or pass judgment on differences of opinion with respect to the intent of the requirements and the workmanship that is produced with the methods specified. This problem has no definite solution except that the more respect he gains from the people with whom he deals, the easier that part of his job becomes.

These are the major problems that can be expected along with numerous day-to-day, perhaps minor but interesting, experiences. Along with the benefits already recognized, we at Western Electric Company are realizing, more and more, the importance and value of standardization of shop practices as time goes on. It has become a tool, as important as any mechanical or electrical device required to process the product. Small companies as well as large industry can also realize the many benefits, measurable and immeasurable, from a program of standardization of shop practices.



Drafting Standards for Electrical Diagrams

by V. W. BENNETT

BASIC INFORMATION common to all electrical diagrams, and a detailed section on schematic diagrams, make the newly published Section 15 of the American Standard Drafting Manual highly useful to all engaged in developing or manufacturing electronic and communication equipment. The new standard on electrical diagrams is one of the 18 sections of the American Standard Drafting Manual, Y14. Eleven of the 18 have been published.[1]

No previous national standard has covered the preparation of electrical diagrams. When electrical diagram standards have been prepared, they have almost exclusively been projects of individual companies; at that, not too many such standards existed when the development of Section 15 was first undertaken. Section 15, therefore, may suggest worthwhile improvements for companies that already have a standard; it can also be readily adapted as a basic standard by those who have none. The possibility of using it in this manner was given particular attention during its development.

To make it easier to use the standard in drafting rooms, and to help those who are inexperienced, the information in the standard is arranged in a sequence which closely approximates the order of the drafting steps normally taken in the preparation of a schematic diagram.

The standard, as published, covers definitions of electrical diagrams, general information basic to all electrical diagrams, general information applicable to single-line and schematic diagrams, and detailed information on single-line and schematic diagrams for electronics and communications.

Detailed information on single-line and schematic diagrams for power switchgear and industrial control

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[1] Size and Format, Y14.1-1957; Line Conventions, Sectioning and Lettering, Y14.2-1957; Projections, Y14.3-1957; Pictorial Drawing, Y14.4-1957; Dimensioning and Notes, Y14.5-1957; Screw Threads, Y14.6-1957; Gears, Splines, and Serrations, Y14.7-1958; Forging, Y14.9-1958; Metal Stampings, Y14.10-1959; Plastics, Y14.11-1958; Fluid Power Diagrams, Y14.17-1959.

has not been included in this publication but will appear in a later issue of the standard. This later publication will also include information on connection diagrams for all areas of the electrical industry.

To permit these and subsequent additions to be made readily, the standard is conveniently sectioned.

The paragraphs that comprise a section appear under a specific paragraph number. The grouping of paragraphs covering a section on a particular subject is given for easy reference at the beginning of the standard in a table of contents. All sections of the standard are amply interspersed with illustrations that supplement specific portions of the text. For the convenience of the user of the standard, these illustrations are usually found adjacent to the related text. For an integrated presentation of the principles illustrated in these separate figures, typical over-all schematic diagrams are also shown at the end of the standard.

The standard is comprehensive in presenting essential fundamentals that enter into the preparation of schematic diagrams for electronics and communications.

By means of schematic diagrams, both the function of an electrical circuit and the requirements of the components in the circuit are specified. In this manner, the schematic diagram conveys basic information from which subsequent engineering functions pertaining to construction and the operation and maintenance of the finished product may be determined.

With appropriate standardized symbols and conventions, component parts are identified as to their individual functions and the requirements for their over-all circuit performance. Component parts appear in the diagram without regard to their actual physical size, shape, or location. The primary objective, as noted in the standard, is to arrange the information in such a way that it will help in tracing the connections of the circuit and in clarifying its functions. In addition to identifying the components used in a circuit, the schematic diagram also shows terminal identifications of components and critical electrical conditions. This information is essential in the preparation of subsequent manufacturing drawings, such as connection diagrams and assembly drawings of the over-all equipment. The adequate preparation of these drawings, particularly connection diagrams, is dependent on a properly prepared and readily understandable schematic diagram. Hence the special attention given in this standard to the preparation of schematic diagrams.

Since the standard sets forth preferred methods for the preparation of schematic diagrams, it should encourage the adoption and use of uniform practices in electrical drafting. This in turn will help promote consistent interpretation of schematic diagrams, which should be appreciated in a field of engineering that is undergoing such remarkable expansion as this one is.

Whenever possible, the standard reflects the simplified drafting approach to preparation of a drawing. On use of symbols, abbreviations, and similar problems, coordination with existing standards has been faithfully maintained. Where appropriate, ample reference is made to supporting standards.

DEVELOPMENT of the standard was the result of a joint effort participated in by many representative areas of the electrical industry. In this effort, interested areas of the Department of Defense also participated. Development of the standard was mostly the result of committee meeting discussions. To this effort were added written comments submitted by corresponding committee members who could not conveniently attend the numerous meetings because of the time involved in traveling from their companies' distant locations.

Work on the standard extended over a period of five years. During that time, several complete redrafts were widely circulated for review. Comments and suggestions for improvement of these drafts were obtained not only from companies with representatives participating in the work of the committee but also from industry at large, and even from some universities and colleges.

The committee's initial objective was to develop a truly unified standard which would be applicable to all electrical diagrams regardless of the nature of the products involved or their use. However, it became apparent at an early date that coordination of the diverse interests peculiar to power switchgear, industrial control, and electronic equipment would require a method of approach consistent with the broad scope of the problem.

While steadfastly adhering to the principle of a single standard as the ultimate goal, practical committee operation indicated the desirability of a division of responsibilites among separate task groups. Thus, for the preparation of this standard, two task groups were organized. Task Group 1 was assigned the responsibility of evolving information which would apply mainly to electrical diagrams of the type used by the electronics and communications industries. Task Group 2 had a similar responsibility with respect to electrical diagrams used by power switchgear and industrial control industries. Through a central steering committee, the work of the task groups was reviewed to prevent unnecessary duplication of effort and to isolate selectively areas in which practices are similar enough to permit the task groups to coordinate their efforts and unify specific parts of the standard. With regard to schematic diagrams, practices have in large measure been unified, notwithstanding the considerable proportion of the standard that appears to be given to information for use in the electronics and communications industries. Basically, the same practices are equally applicable to power switchgear and industrial control.

REDUCING ITEM VARIETIES

PART ONE

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Based on a paper presented at the American Standards Association Company Member Conference in Philadelphia, Pennsylvania, on May 2, 1960.

SOME EXCELLENT PAPERS [1] studies [2, 3] and books [4, 5] have been published over the years on the problem of reducing or standardizing or simplifying the variety of parts used within a company or in a design. It is always presented as the thing to do, and many of the same logical reasons for doing it are listed over and over again. Yet, discussion during these conferences on the success of such programs has usually been limited to the hardware items or other relatively minor bits and pieces used within the products. It would appear that few cases of substantial standardization or reduction in variety of significant functional units within a company or industry have clearly been identified as a direct result of such standardization efforts. In every field of endeavor an almost infinite variety of parts, components, and assemblies still seem available to do essentially the same jobs with varying degrees of reliability, functional sophistication, and cost.

If this is so, some re-evaluation appears to be in order. We might ask:

Have we really failed to achieve a significant reduction in item variety in spite of all the effort?

Is a reduction in item variety always what we really want?

Why haven't the principles of standardization been widely applied to the more complex items?

Is it really impossible to measure such standardization savings and effects?

Are these deficiencies caused by a basic difference in requirements, or simply by insufficient motivation to do the job on this scale?

Must our basic definition of what constitutes standardization be changed to achieve success in reducing item variety on a broader scale?

In short, what does it take to get tangible results?

Actually, much more standardization goes on every day than we realize, or than we recognize as standardization. However, imagination is required to apply the recognized concepts of standardization to these new areas—and even more, to develop new concepts and reduce them to practice.

Basic Requirements for Standardization

Although in each case the environment may be different, I submit that the basic requirements for standardization are the same. However, there is no cheap and easy solution.

To achieve standardization, management support, alone, is not sufficient. A self-supporting operation must be set up to provide:

1. An optimum answer to the specific problem to be solved, readily available, in usable form, from a reliable source, when and where it is needed by the user.
2. A description for the user of the tangible and other benefits of using the proposed solution, expressed in terms relating to the user's area of responsibility. These must make sense in their own right.
3. An effective system of control and measurement, which will provide feedback rapidly enough to initiate corrective action before the point of no return on deviations from the standards.

The frame of reference may be different for a company standards program, for an industry standards program, or for a military standards program. However, the same motivation for standardization, within a company as well as across industry and military lines, does exist. It's called competition. It takes many forms but the payoff is always spelled with a large dollar sign [6].

The free enterprise system gives each manufacturer the basic right to develop, produce, and price his product as he sees fit. To succeed, he must control the costs which go into the price of his product and establish a price which is competitive and also which provides his stockholders with a satisfactory return on investment. The normal product attrition in industry, over 80 percent during any period of time, is caused by the inability of many companies to meet these requirements. This provides a greater degree of standardization than we realize [7].

"Product" Planning

Such attrition cannot be expected to achieve optimum standardization through natural selection rapidly enough to minimize wasted effort and resources. Most important, in a dynamic technology like electronics, it will not provide satisfactory standards in time to satisfy the majority of the potential requirements. Successful "products" of the standards program, like successful company products, don't just happen, they must be planned that way [8].

It is therefore incumbent upon a company, or the industry, trade association, professional societies, and other organizations representing that industry, to define and plan those things which can realistically be standardized, define optimum standardization, and provide over-all coordination to achieve it in an orderly manner in the best interests of all concerned.

The problem seems to be to achieve standardization in an optimum manner while encouraging technical progress.

To achieve industry-military standardization, similar planning activity must take place. This has been pointed out again recently on several occasions [9, 10].

When engineering, tooling, and production involve highly complex items using technology on the frontiers of our knowledge, the standardization problem often assumes characteristics different from those of the hardware area [11]. Premature standardization or over-standardization must constantly be guarded against. Yet, future needs must be anticipated if standards are to be available when needed. In the design and construction of large computers, for example, automated assembly lines required for the manufacture and testing of printed wiring, modular assemblies, semiconductors, and similar components involve significant investment and long lead time. They require a redefinition of what is to be standardized and how to measure the effectiveness of such a standards program. Reduction in process variety and maximum yield from the manufacturing process, rather than part number reduction, may be the most profitable goal. The more complex the item and the earlier the standardization is attempted, the more basic the level at which it must be applied.

The automated processes anticipated for the continuous-batch manufacture of such major functional assemblies as molecular circuits are a more extreme example. They may even preclude selection from among general purpose catalog unit items in some of the processes of product design. Standardization here seems to take on characteristics completely different from those of item reduction [12].

It becomes essential that the planning of the product line for years ahead take into account the degree of standardization expected and the effect this standardization will have on the engineering, manufacture, marketing, servicing, and pricing of the products involved. Balanced against this must be serious consideration of the danger of obsolescence from technological change, and the ability to phase-in new technologies, and new products using these technologies, in an orderly and profitable fashion for both the old and new lines.

Motivating the Man

Assuming that satisfactory standards are available, and the information and assistance to apply them are also available, why doesn't the engineer react in a proper manner?

In the first place, standardization often appears to confront the design engineer with a serious conflict of interests. Being an engineer, he has been trained and encouraged to be original. He is hired and paid to be original. His measure of success is in how many new and different things he can produce in a given time.

There is also human cussedness and the "NIH (Not Invented Here) Factor" [13].

In the face of this he is now told to use what is already available in every possible instance unless he can actually justify the change or difference.

The major solution is to motivate him properly. But the usual eulogy on standardization doesn't interest him in the least. Examples based on the experience of others are seldom pertinent to his problem and are usually insufficient to overcome his motives for doing something else. He requires something more direct. For example:

Effort over many years has been spent to achieve a common language in the world. Many such "standards" have been proposed, Esperanto and Interlingua, to name but two. All sorts of obvious logical benefits are offered, yet little progress seems to be made. Why? Most people simply won't make the necessary effort when they cannot identify the benefits with their own interests.

If a person were told, however, that his salary would be doubled as soon as he could exhibit satisfactory proficiency in the use of Interlingua, I'll bet he would be an expert in a month.

If possible, the standard requirements should be specified in such a way that the product can meet the over-all market goals of the company in a competitive environment using existing technology and components. The engineer must be educated to the fact that something new and different but not better cannot be justified, and that change will be made only when it can be supported by the value of the improvement achieved. A clearly stated company policy to this effect is required. Progress is not really progress if it does not provide the best return on the investment required to achieve it.

Recognition for ingenuity displayed, not just in solving a problem but in solving it with optimum application of existing standards, would provide a real motivation for the professional person to standardize. Today's emphasis only on newness and uniqueness by the professional and industrial groups does not convey the concept that it is often more challenging to solve a problem with what is already available. Real creativity is fostered by freedom from problems already solved and concentration on those new problems worthy of the effort required to solve them.

To justify this level of support places upon the standards program the burden of providing dynamic standards in a competitive atmosphere, priced to give the user an advantage, and designed to out-perform the competition.

Conversely, since the company management has made the decision to invest in such a program and to proceed in this direction on an item, the designer then must be placed in a position of justifying to the management has use of a nonstandard item when a standard item exists. His performance should be evaluated not only on the basis of his advance in the

state of the art and in providing new and different designs, but also on the basis of the total cost and profit he contributes to the company. The true cost of introducing new items and new techniques to the company must be subtracted from the benefits to be gained, and equated with the possible alternatives using standardization, in measuring his actual progress.

For the project manager, the pressure to achieve satisfactory program results, in spite of the ever inadequate budget, manpower, time, and facilities, should serve as a real motivation to standardize wherever possible.

Rapid, effective dissemination of information is recognized as a major problem if standardization is to be accomplished. It has been estimated that as much as 30 percent of the cost of a new product development program may be spent in efforts to determine what has already been accomplished in that area [14]. This results in some degree of standardization. The outcome of research in automatic information retrieval, therefore, promises to provide a major advance in such standardization.

Paradoxically, it is often the little things that will be the most effective. The availability of standard parts in the engineering stock rooms is probably the best incentive for using them, in many instances.

The engineer must have more than current information on what is available and competent engineering assistance in the proper application of these items. He must be assured that when he uses standards he will not be left holding an empty bag. Arbitrary engineering changes which affect financial or functional specifications after he has selected and applied the standards can have a real impact on areas for which he is held responsible, and can seriously reduce his willingness to standardize the next time.

Most important, these decisions must be made during the early phases of a program, when changes can be introduced without a significant impact on over-all schedules and functional requirements. Truly effective standardization begins on the drawing board with standards which have anticipated the need. It is patently unrealistic to wait until an engineering group has designed and built a production model of an item, and then review this in an attempt to achieve significant standardization "after the fact." It becomes even more difficult to go back and try to standardize after this model has been announced to the sales force, tooled, released for production, and possibly even introduced into the product line in the customer's office.

Motivating the Industry

What can motivate standardization within an industry? The same degree of ability to enforce standards usually does not exist here.

Let us refer back to the need for proper definition of optimum standardization in the planning stages of a standards program. Recognition of the possibilities of physical, functional, and financial interchangeability, we find, provides the key. If the industry standards program concentrates on those items which constitute the interface or common link, so that equivalent products of competing suppliers can be applied together without jeopardizing performance or cost of the products, optimum standardization will be achieved and yet technical progress will not be retarded. The efforts of the TV broadcasting industry are an excellent example of successful standardization of this type [15].

Such standardization can open up markets previously considered unprofitable, restricted, or unattainable [16]. The challenging potential for individual company growth and profits should be sufficient motivation to accomplish this.

With respect to industry-military standardization, it is suggested that a way must also be found to establish more accurately the true cost of any program, including its long-term impact on the military maintenance and training systems. This could then be reflected in standardization requirements as part of the contracts with industry. Similar requirements, devised for reliability, value analysis, and schedule compliance, appear to have contributed to the success of these programs. Most important, the motivation to comply must be clearly spelled out.

Measurement

The ability to measure the degree to which standards are being applied, and to project this use into the future, provides an opportunity to establish unit prices on the basis of much larger quantities, and to write off start-up expense accordingly. It requires a sensitive measurement of what is currently happening in the development stages of all new products, as well as actual usage in present products. It also requires good product market forecasts. What is being used, the degree to which it is being used, and the effect on the over-all quantities and prices of a decision to use or not to use a standard must be analyzed rapidly.

In effect, market research and forecasts four or five years into the future on standards program "products" should be carried out in much the same way that future markets and prices are determined and periodically re-confirmed for regular products. The results of this analysis must then be fed back to modify the original plans. At the same time, corrective action could be initiated in time to achieve the degree of standardization required to meet the current objectives. A significant financial advantage over the nonstandard competition can be gained in this way with reasonable confidence, by spreading the costs over all uses, larger quantities, and a much greater period of time. In effect, this penalizes those who do not use the standard, by requiring each to absorb the full costs of his decision to introduce a new and different item, perhaps on lesser quantities, and in a much shorter time.

Analysis of trends and other statistics derived from processing the actual operating records will provide a factual indication of the degree of standardization achieved and the relative value of the areas in which standards are achieved. It will also identify additional potential areas for profitable standardization. In addition, it will indicate those areas in which present standards are not effective. Comparisons between estimated and actual performance over a period of time will allow more precise future selection and application of standards.

The estimates of savings from standardization can be broadened to include such factors as direct effects on product costs, markets, and profit margins, as well as reduction in internal operating cost and improved efficiency of operation.

Any estimate of total savings requires ability to identify and establish total costs, and to evaluate the effects of alternative decisions on this relationship. M. E. Salveson in his article "High Speed Operations Research," points out that only with such knowledge and control can we really manage progress [17].

Application of scientific programming techniques and large-scale computers to the operation greatly improves the possibility of an optimum decision in allocating the limited means available to reach specific goals in the best fashion [18].

The results of better measurement and evaluation can be a significant part of the motivation to standardize, particularly if these results can be expressed in terms of the effect on the engineers or their projects. However, the reasons for not standardizing must not be ignored in the process. Standards cannot be static. The nonstandard alternatives must always be analyzed as possibilities for improving existing standards, or introducing new standards. Complete agreement, or 100 percent use of standards must also be recognized as a danger sign, since such meek compliance might indicate that progress has stopped. A basic requirement for growth and progress seems to be a certain amount of conflict or disagreement. The real problem here is to establish the optimum degree and make satisfactory progress in this environment.

The best motivation is wasted if the standard is inadequate for the application, or if the degree of improvement offered by the nonstandard item justifies its use.

In any discussion of item reduction or standardization, the first impression appears to be that only the selected standards are involved, to the virtual exclusion of everything else. The use of nonstandard but previously available items should be encouraged where a standard will not serve, rather than force the release of a new item by restricting information on otherwise satisfactory nonstandard parts. Item reduction is a matter of degree and any decision which will assure the maximum return on an investment already made appears to be a move in the right direction.

The possibility that use of a standard by one project will impose a penalty on that project even though it benefits the over-all company position, requires measurement and evaluation techniques sufficient to identify this net gain. Such cases must be recognized and motivated accordingly. Few standards represent an optimum solution in all respects for every application and the cost of the compromise must be offset by some equally tangible benefit, or subsidized, if the individual decision is to be in favor of standardization. Conversely, the effect of a decision by one project not to standardize should also be reviewed in terms of its possible impact on all other parts of the company.

References

1. White, Arnold B. Development of a dynamic standards program, *Standards Engineering: The Magazine of the Standards Engineers Society*, vol 9, No. 3, June-July, 1957, p 1.
2. *Company Standardization: Organization—Costs—Savings*. New York: American Standards Association, 1959.
3. *Industrial Standardization: Company Programs and Practices. Studies in Business Policy No.* 85. New York: National Industrial Conference Board, Inc, 1957.
4. Melnitsky, Benjamin. The underlying profit motive. *Profiting from Industrial Standardization*. New York: Conover-Mast Publications, Inc, 1953, pp 17-32.
5. Watts, C. R. Standards in the Federal supply system—military goods. *National Standards in a Modern Economy*, ed. Dickson Reck. New York: Harper and Brothers, Inc, 1956, pp 217-259.
6. Sobelman, Sidney. *A Modern Dynamic Approach to Product Development*. Dover, N. J.: Picatinny Arsenal, 1958, pp 15-28.
7. Jones, Conrad and Johnson, Samuel C. How to organize for new products. *Harvard Business Review*, vol 35, No. 3, May-June, 1957, pp 49-62.
8. Karger, Delmar W. and Murdick, Robert G. An overall look at product planning. *Machine Design*, March 31, 1960, pp 94-100.
9. Lippke, James A. D.O.D. must linear program. *Electronic Design*, vol 6, No. 17, August 20, 1958, p 19.
10. EIA and DOD officials meet on reliability problems. Statement on EIA position on improved standardization, by Capt Henry E. Bernstein. *EIA Weekly Report to the Electronics Industry*, vol 16, No. 8, Sect A, February 23, 1960, p 2.
11. Gay, Roger E. Tomorrow's automation needs new standards today. *National Standards in a Modern Economy* (see [5]) pp 352-361.
12. Alspach, P. H. Developing large-scale automation. *Automation*, March 1957, pp 67-72.
13. Stanly, A. L. Logic and illogic in engineering and management. *IRE Transactions on Engineering Management*, vol EM5, No. 4, December, 1958, pp 144-151.
14. Hilty, D. C. Industrial research. *Information Resources: A Challenge to American Science and Industry*, by Shera, J. H., Kent, A., and Perry, J. W. Cleveland: Western Reserve University, 1958, p 55.
15. Smith, David B. The NTSC—an exercise in technical co-ordination. *Proceedings of the IRE*, vol 42, No. 1, January, 1954, pp 11-14.
16. Keller, Arnold E. Major breakthrough in paper processing. *Management and Business Automation*, vol 1, No. 3, March, 1959, pp 14-20.
17. Salveson, Melvin E. High speed operations research. *Harvard Business Review*, vol 35, No. 4, July-August, 1957, pp 89-99.
18. Vazsonyi, Andrew. *Scientific Programming in Business and Industry*. New York: John Wiley and Sons, Inc, 1958.

Some Hard Facts about Soft Standards

Reprinted from Transmission and Distribution *magazine. This editorial was written by H. M. Jalonack, consulting engineer, and for many years chairman of the Subcommittee C57-12 of ASA Sectional Committee C57, responsible for preparing the draft standards on power and distribution transformers.*

ALMOST ALL ELECTRIC UTILITY men and electric equipment manufacturers agree that industry equipment standards make sense both from a first cost and from an operating cost viewpoint. Many millions of dollars have been saved in the past by well-conceived standards thoroughly supported by utility purchasers. The advantages of such a program are far from exhausted. On the contrary, there are great potential future savings—*but!*

But – in the past several years there has developed a serious threat to such savings as the result of lack of support of industry standards both in buying and selling practices. This lack of support has not been universal either on the part of utility buyers or manufacturers but it has been sufficiently widespread to handicap seriously a continuing cost-reduction program. The reasons for this growing lack of support of a sound principle deserve careful analysis.

One reason is impatience. Some utility engineer feels that a variation from the current industry standard would result in economies in installation, operation or maintenance. The presentation of such ideas to industry committees of users and manufacturers takes a reasonable amount of time. This engineer would like to force the issue in favor of his brainchild. So he jumps the gun. He finds one or more manufacturers willing to cooperate by putting such non-standardized units on a standard price, data and shipment basis. The result is a serious dislocation in the market place and quite often a pressure move to make the departure respectable by giving it the status of an industry standard. It might have reached this status in an orderly way through correct industry procedure or it might not have. However, an adequate review of it by the appropriate industry standardizing committee might well have shown the variation to have been ill-advised, either from a use or manufacturing standpoint, or both. Or if the idea were sound, committee action might well have substituted the new design for an existing type instead of just adding one more type of equipment to a list already overburdened with too many types and ratings.

A second reason for the non-use of standards is habit or tradition. Standardization groups seldom if ever can receive 100 percent approval from all users on proposed standards. Support from a high percentage of user-advisers offers the best method of selection and that is the basis of practically all industry standards. However, through habit, tradition, conservatism – call it what you wish – some users want to continue with a discontinued standard. If they insist long and hard enough, it is sad but true that they will find manufacturers to support their viewpoint.

There are other reasons, too, such as lack of understanding of basic manufacturing methods or unwillingness to make a short-time sacrifice for the sake of long-range benefits. The hard fact is that standards are often soft because some users are willing to disregard the standards to get what they want, and some manufacturers are willing to extend as favorable offers as if the equipment were standard for the sake of the order.

Now standardization is a two-handed game. The purchaser should be as anxious to support standards as the manufacturers, perhaps more anxious. Failure to do so means a gradual loss of the benefits of mass or semi-mass production since it tends toward a straight job shop operation. Higher manufacturing costs must eventually be reflected in higher prices. The users who are hurt the most are those who believe in standards, who use them but who are inflicted with the higher price levels brought about by the few who do not cooperate.

Some utility people feel it is up to the manufacturers to support the standards by suitable price, guarantee, and shipment advantages. This most of them seriously endeavor to do. Such advantages, however, cannot continue in the face of a determined effort to break them down by a prospective purchaser with substantial requirements for the product involved. If support of standards needs crusaders – and right now it does – they must be recruited from the ranks of users as well as from those of the equipment manufacturers.

STANDARDS FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Information about those standards not selected for listing in THE MAGAZINE OF STANDARDS may also be obtained from the ASA Library. Orders for these standards may be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. For the convenience of readers, the standards are listed under their general Universal Decimal Classification number. In ordering copies, please refer to the number following the title.

539.1 NUCLEAR

France (AFNOR)

Nuclear energy. Vocabulary NF M 60-001
Equivalent French and English terms FD M 60-002

54 CHEMISTRY

Belgium (IBN)

Water analysis. Oxydability by the permanganate method (organic matter) NBN 542

France (AFNOR)

Testing chlorhydric acid for iodine number NF T 20-315
5 stds for various tests of caustic soda NF T 20-321/4,-6
4 stds for various tests of sodium carbonate NF T 20-329/332
2 stds for chemical analysis of ammonium NF T 20-341/2
Water analysis NF T 90-018

Israel (SII)

Testing of water: hardness S.I. 249

Spain (IRATRA)

Sampling of water used in chemical analysis UNE 41 122

United Kingdom (BSI)

Weighing vessels for microchemical analysis: Group H: Weighing accessories BS 1428: Part H1:1960

USSR (GOST)

Reagents. Formic acid GOST 5848-60
Reagents. Ammonium metavanadate GOST 9336-60
Reagents. Sodium phosphate, tribasic GOST 9337-60
Ammonium sulfate GOST 3769-60
Ammonium chloride GOST 3773-60
Ammonium fluoride GOST 4518-60
Stearic acid GOST 9419-60
Silicic acid anhydride GOST 9428-60

621.6 FLUID DISTRIBUTION, STORAGE, CONTAINERS. PIPES. PUMPS

Austria (ÖNORM)

Steel pipes, light series, welded or seamless ÖNORM M 5610
Steel pipes, medium-weight series, welded or seamless ÖNORM M 5611
Steel pipes, heavy series, welded or seamless ÖNORM M 5612

Belgium (IBN)

Plastic pipes for fluids, o.d. and nominal pressures NBN 560

Czechoslovakia (CSN)

Single-spindle rotary pumps CSN 11 6303
Centrifugal pumps CSN 11 3003
Three-spindle rotary pumps CSN 11 6703
3 stds for screened suction valves for pumps CSN 11 1263,-64,66
Cylinder for mining hand pumps CSN 11 2012
Plungers for hand pumps CSN 11 2020

Finland (SFS)

Sand-cast flanged pipes, class B B. VIII.31
7 stds for cast iron bell and socket pipes and fittings B. VIII.32/38
2 stds for special castings—caps and plugs B. VIII.45/46
Cast-iron flanges B. VIII.47
Cast-iron flanges spigot B. VIII.49
Cast-iron double flange 1/4 duckfoot bends B. VIII.51
Cast-iron blank flanges B. VIII.62

France (AFNOR)

Cast-iron pipes and fittings. Terminology and specification NF A 38-011
Gas pipes, medium series NF E 29-025
Gas pipes, light series NF E 29-027

Israel (SII)

Asbestos cement pressure pipes S. I. 333

Italy (UNI)

Asbestos-cement pressure pipes UNI 4372

Japan (JISC)

Lift check valves, marine bronze, 5 kg/cm² JIS F 7356
4 stds for globe and angle valves, marine bronze JIS F 7301/4
6 stds for globe and angle valves, cast iron JIS F 7305/10

Netherlands (NNI)

Cast-iron parts for pressure main lines, socket and spigot tapers NEN 421
Cast-iron parts for pressure main lines. Flanged spigots NEN 422
Cast-iron pipes and fittings (LNA pipes and fittings) NEN 3238
Wall plates for tapcocks NEN 2285

Spain (IRATRA)

Color code for pipe lines UNE 1 063
Common gas pipes, steel, screwed UNE 19 040
Loose flanges for nominal pressure 10 UNE 19 283

Switzerland (SNV)

8 stds for collarless, arc-weldable pipe flanges, type G, for nominal pressure from 2.5 to 100 kg/mm² VSM 18461/5

Turkey (TSE)

Valves for small water distribution system TS 6
Cast-iron pipes and fittings TS 10

United Kingdom (BSI)

Solid drawn steel air receivers BS 430:1960
Flanged and butt-welding end steel outside-screw-and-yoke wedge gate valves for the petroleum industry BS 1414:1960
Flanged and butt-welding end steel plug valves for the petroleum industry (excluding well-head and flow-line valves) BS 1570:1960
Flanged cast iron gate valves, classes 125 and 250, for the petroleum industry BS 1735:1960
Flanged steel check valves for the petroleum industry BS 1868:1960
Flanged steel globe valves for the petroleum industry BS 1873:1960

USSR (GOST)

Axial flow pumps. Types and main technical data GOST 9366-60
Threaded steel flanges for PW 320 and 700 kgf/cm² GOST 9399-60
Connecting ends for valves, fitting and pipes for PW 320 and 700 kgf/cm². Dimensions GOST 9400-60

669 METALLURGY

Australia (SAA)

Testing zinc coating on hot dip galvanized articles K.53-1960

Belgium (IBN)

I.P.E. beams. Beams with parallel flanges NBN 533
Content of cobalt in steel and cast iron. Gravimetric method NBN 543

Czechoslovakia (CSN)

3 stds for structural steel CSN 41 1483,-1523,-1583
Analysis of nickel alloys CSN 42 0641
10 stds for different grades of tool steel CSN series 41.9
Steel wire for bicycle wheel spokes CSN 42 6414
5 stds for round, square, and hexagonal rods, cold drawn, different grades CSN 42 6510/1,-20,-22,-30

Denmark (DS)

Reverse bend testing of wires DS 10311
Steel bars for reinforced concrete, testing DS 13080
Steel wires for reinforced prestressed concrete, testing DS 13081

France (AFNOR)

Aluminum, non-alloyed in ingots NF A 57-101
Bronze, table of qualities NF A 53-012

Germany (DNA)

Heat treatment of iron and steel, technical terms DIN 17014
Testing of steel sheets for weldability DIN 50130
Copper alloys DIN 1718
Flat copper wire and rod drawn with rounded edges DIN 46433, Section 1/3
Tensile test of fusion butt-welds of non-ferrous metals DIN 50123
Copper alloy bands for laminated springs DIN 1777

Hungary (MSZH)

2 stds for heat- and acid-resisting steels, rolled and forged MSZ 3359/60

India (ISI)

Method for brinell hardness test for steel IS:1500-1959
General requirements for supply of metals and metal products IS:1387-1959
Thickness of sheet and diameters of wires IS:1137-1959

Israel (SII)

Galvanized sheets S. I. 313
Anodic coating on aluminum S. I. 325

Italy (UNI)

Carbon steel round bars for links of common chain UNI 4243
Hot- or cold-stamped steel bolts, quality requirements, tests of UNI 4365
Determination of tin content in aluminum alloys, volumetric method UNI 4229
Copper alloys for stamping UNI 4244
12 stds for photometric method of chemical analysis of tin for the content of different substances UNI 4341/52
10 stds for different methods of chemical analysis for determination of various ingredients in manganese UNI 4353/62
2 stds for chemical analysis of manganese UNI 4363/4
Non-ferrous metals and their alloys. Determination of grain sizes UNI 4389
Bending tests of metals UNI 564
Charpy impact test for steel UNI 4431

Spain (IRATRA)

Color code for identification of metal alloys UNE 38 003
4 stds for different bars of alloy "cuzin" UNE 37 121/4
4 stds for different bars of alloy "custan" UNE 37 125/8
Aluminum and aluminum alloy T-shapes, hot-rolled UNE 38 055
Aluminum and aluminum alloy I-beams with unequal flanges, hot-rolled UNE 38 061

Switzerland (SNV)

3 stds for copper flat bands, drawn, with sharp edges VSM 11824
Copper rounds, common quality, drawn VSM 11827
Copper sheets and bands, cold-rolled VSM 11853
Brass sheets and bands, cold-rolled VSM 11855

Turkey (TSE)

Electrolytic copper, semi-manufactured TS 1

United Kingdom (BSI)

Methods for the analysis of aluminum and aluminum alloys: Silicon (perchloric acid method) BS 1728: Part 11:1960

USSR (GOST)

Casting brass ingots GOST 1020-60
Copper-beryllium alloy strips and bands GOST 1789-60
Wrought brass rods GOST 2060-60
Wrought stannum-zinc bronze rods GOST 6511-60
Gold-rolled bands of heavy non-ferrous metals and alloys. Range GOST 3718-60
Aluminum alloys. Methods of spectral analysis GOST 7727-60

674 WOOD INDUSTRY

Australia (SAA)

Round section stringers from western Australian timbers O.46-1960
Parquetry flooring
Wood floors for parquetry flooring O.71-1960
Australian std code for recommended practice for the laying of parquetry flooring CA.31-1960

Canada (CSA)

Physical properties of jack, lodgepole, and red pine poles, and reinforcing stubs O15.3-1960
Specification for hardwood plywood O115-1959
Specification for glue-laminated softwood structural timber O122-1959

Italy (UNI)

4 stds for plywood: classification, testing UNI 4367/71
4 stds for floor boards UNI 4373/6

Union of South Africa (SABS)

Wooden handles for universal type picks SABS 692-1959
Specification for chromated copper arsenate for timber preservation SABS 673-1959

USSR (GOST)

Chemical pulp. Method of determination of copper number GOST 9418-60
Sulfite bleached wood (coniferous) pulp GOST 3914-60

677.72 WIRE ROPES

Belgium (IBN)

Steel wire ropes NBN 12

Czechoslovakia (CSN)

21 stds for different types of wire rope CSN series 02 4310

Netherlands (NNI)

Steel wire ropes of wires with minimum tensile strength of 130 kgf/mm^2, test methods of NEN 3175

Italy (UNI)

19 stds for different types of wire rope UNI 4432/49

744 TECHNICAL DRAWINGS

Austria (ÖRNORM)

Cabinets for storage of drawings ÖNORM A 6210
Greek alphabet as used on drawings ÖNORM A 6012

Finland (SFS)

Projections: types of lines and sectioning B.II.5
Dimensioning B.II.9

India (ISI)

Engineer's pattern tee-squares IS:1360-1959

Netherlands (NNI)

Engineering drawings. Indication of current screw threads NEN 784

Spain (IRATRA)

Specimens of lines UNE 1 033

77 PHOTOGRAPHY AND CINEMATOGRAPHY

Czechoslovakia (CSN)

Magnetic coating on 8-mm film CSN 19 8125
Magnetic coating on 16-mm film CSN 19 8225
Motion-picture film sprockets CSN 19 8910

France (AFNOR)

Photographic paper in sheets and rolls for reproduction of documents NF S 21-003
Accessory shoe and foot NF S 22-006
Location of film numbers on backing paper NF S 22-007
Image dimensions on films for 35-mm camera spools NF S 22-008

Germany (DNA)

35-mm sound film: location of sound track and image DIN 15503
16-mm sound film: location of sound track and image DIN 15603
Labeling photographic material DIN 16541

New International Recommendations . . .

ISO Recommendations are published by the International Organization for Standardization, and IEC Publications by the International Electrotechnical Commission, Geneva, Switzerland. Copies are available from ASA.

GUIDE ON THE FORM FOR STANDARDS FOR CHEMICAL PRODUCTS AND FOR METHODS OF CHEMICAL ANALYSIS. ISO R 78. *December 1958. First edition. $3.00.*

BRINELL HARDNESS TEST FOR STEEL. ISO R 79. *February 1959. First edition. $1.50.*

ROCKWELL HARDNESS TEST (B AND C SCALES) FOR STEEL. ISO R 80. *February 1959. First edition. $1.50.*

VICKERS HARDNESS TEST FOR STEEL. ISO R 81. *February 1959. First edition. $1.50.*

TENSILE TESTING OF STEEL. ISO R 82. *February 1959. First edition. $2.70.*

CHARPY IMPACT TEST (U-NOTCH) FOR STEEL. ISO R 83. *February 1959. First edition. $1.50.*

IZOD IMPACT TEST FOR STEEL. ISO R 84. *February 1959. First edition. $2.40.*

BEND TEST FOR STEEL. ISO R 85. *February 1959. First edition. $1.50.*

TENSILE TESTING OF STEEL SHEET AND STRIP LESS THAN 3 MM AND NOT LESS THAN 0.5 MM THICK. ISO R 86. *February 1959. First edition. $1.80.*

SIMPLE BEND TESTING OF STEEL SHEET AND STRIP LESS THAN 3 MM THICK. ISO R 87. *February 1959. First edition. $1.20.*

REVERSE BEND TESTING OF STEEL SHEET AND STRIP LESS THAN 3 MM THICK. ISO R 88. *February 1959. First edition. $1.20.*

TENSILE TESTING OF STEEL WIRE. ISO R 89. *February 1959. First edition. $1.50.*

BALL AND ROLLER BEARINGS. BOUNDARY DIMENSIONS. ISO R 104. *April 1959. First edition. $1.50.*

BALL AND ROLLER BEARINGS. ACCESSORIES. ISO R 113. *May 1959. First edition. $1.50.*

CLASSIFICATION AND COMPOSITION OF REMELT INGOTS AND PIGS OF UNALLOYED ALUMINUM. ISO R 115. *July 1959. First edition. $0.60.*

ASBESTOS CEMENT PRESSURE PIPES. ISO R 160. *June 1960. First edition. $2.70.*

RECOMMENDATIONS FOR VOLTAGE MEASUREMENT BY MEANS OF SPHERE-GAPS (ONE SPHERE EARTHED).

IEC Publication 52. 1960. Second edition. $3.20

Applies to the measurement of the peak value of alternating voltages, full standard, or longer-tailed impulse voltages. Rules are given for the construction of standard sphere-gaps and their use, while the peak values of the disruptive voltages in air for various spacings between the spheres are given in tabular form.

DIMENSIONS OF ELECTRONIC TUBES AND VALVES.

IEC Publication 67. 1960. Fourth supplement. $2.40.

This publication is in loose-leaf form and the following standards sheets are included in this supplement: *Bases*—Medium 4-pin base with bayonet; B8G base; B8A base; Small button Noval 9-pin base; Diheptal 14-pin base; Duodecal 12-pin base; Shell sizes of duodecal base; Small-shell submagnal; Pee Wee 3-pin base gage; Medium-shell giant 5-pin base with bayonet; B5E base. *Outlines*—T3 subminiature tube outlines used with subminiature base E8-9; T3 subminiature tube outlines used with subminiature base E8-10. *Caps*—Cylindrical caps.

RECOMMENDATIONS ON DETERMINATION OF EFFICIENCY OF ROTATING ELECTRICAL MACHINERY (EXCLUDING MACHINES FOR TRACTION VEHICLES).

IEC Publication 34-2. 1960. Second edition. $3.20.

Gives the losses to be included for the different types of electrical machines, when the efficiency is determined by the method of summation of losses. Appendixes give information on the so-called calibrated-motor and retardation methods. This new edition of IEC 34-2 takes into account the newer insulating materials and contains clauses dealing with the determination of losses in each of the three following schedules which state the losses to be included: Schedule I—d-c motors and generators; Schedule II—polyphase induction motors and induction generators; Schedule III—polyphase synchronous motors and generators.

RECOMMENDATION FOR COMMERCIAL ANNEALED ALUMINUM ELECTRICAL CONDUCTOR WIRE.

IEC Publication 121. 1960. First edition, $0.80.

Lays down the physical and mechanical property values of commercial annealed aluminum electrical conductor wire having a diameter greater than 1 mm (0.0394 inch).

RECOMMENDED BASIC CLIMATIC AND MECHANICAL ROBUSTNESS TESTING PROCEDURE FOR COMPONENTS FOR ELECTRONIC EQUIPMENT.

IEC Publication 68. 1960. Second edition. In two parts—Part I, $3.20; Part II, $7.20.

Describes a general procedure for climatic and mechanical robustness tests, designed to assess the durability under various conditions of use, transport, and storage of components used in equipment for telecommunication and in electronic equipment employing similar techniques.

Part I, General, gives a description of the framework of the test procedure to be used. *Part II, Tests,* describes the different tests in detail. It is issued in loose-leaf form, and supplements will be added from time to time. The two parts of IEC 68 are intended to be used in conjunction with each other.

. . . Questions

We would like to check on the safety of a rope tow. Where can we find a standard for this purpose?

The new American Standard Safety Code for Aerial Passenger Tramways, B77.1-1960, includes a section on rope tows. As far as we know there is no other publication available. (See article on page 261, September issue, *Mag. of Stds.*).

Are the Munsell notations carried on the color chips for gray finishes for industrial apparatus and equipment (American Standard Z55.1-1950) "book notations" or "re-notations" conforming to the rules of the Commission Internationale de l'Eclairage?

The Munsell notations used in American Standard Gray Finishes for Industrial Apparatus and Equipment, Z55.1-1950 (R1959) are the re-notations recommended in the smoothed curves of the Newhall-Nickerson-Judd report. This is identified as: Final Report of the Optical Society of America Subcommittee on Spacing of the Munsell Colors, *Optical Society of America Journal,* 33, 385-418 (1948).

Where can we find standards for cryogenic piping?

Sectional Committee B31 has been considering inclusion of a section on this type of piping in the American Standard Code for Pressure Piping. However, so little basic data exists at present covering the behavior of metals at the temperatures encountered in cryogenics that it will be some time before anything can be developed. Meanwhile, the committee is recommending use of Section 3 on Petroleum Refinery Piping, B31.3-1959, as the most complete and up-to-date section, as a guide.

• NEWS BRIEFS

GAILLARD SEMINAR ON INDUSTRIAL STANDARDIZATION

DR JOHN GAILLARD, consultant on industrial standardization, will hold his next five-day seminar in the Engineering Societies Building, New York City, from January 23 through 27, 1961. His seminars are intended to assist top management in establishing the most effective administrative setup, procedure, and program for handling standardization work in the individual company, and in training staff men in the functions of the standards engineer, including the art of writing specifications. Attention is given to standardization at all industrial levels, from the operating unit in a company (department, division, etc) to international unification of standards. This includes consideration of mergers, acquisitions, and diversification, and coordination of standards activities in an American company operating in the United States and abroad. A full day will be reserved for round-table discussion of problems of special interest to the companies represented.

The Gaillard Seminars have been attended so far by 427 men from 238 organizations in the United States (including the Armed Forces) and five other countries. For details and registration, write to Dr John Gaillard, 135 Old Palisade Road, Fort Lee, New Jersey.

• THE BRITISH Standards Institution reports that considerable interest was shown in its exhibit at the British Exhibition held early this summer in New York. Typical standards ordered as a result, BSI says, included screwed flanges, mineral insulated cables, gas and dual fuel engines, power-driven mast hoists, test code for gas turbines.

• THE SECRETARY of Labor's Award of Merit has been conferred on Cyril Ainsworth, deputy managing director of the American Standards Association, for outstanding advisory service to the Department of Labor in connection with job safety. For many years Mr Ainsworth was in charge of safety standards for the American Standards Association, before he became technical director of ASA. He has been active in the President's Conference on Occupational Safety, and for more than 20 years has served on various safety advisory committees of the Department of Labor.

"His efforts, along with the services of the association he represents, are credited with the initiation of some 150 voluntary safety codes, and many of the standards thus developed have been used as the basis for state regulations," comments the Department of Labor announcement.

The Department's citation reads: "Official commendation and praise are tendered to Cyril Ainsworth, American Standards Association, in recognition of his significant and outstanding contribution toward furthering the work of the Department of Labor 'to foster, promote, and develop the welfare of the wage earners of the United States.'"

Since Mr Ainsworth was in South America to attend the twenty-fifth anniversary of the Argentine standards association and visit a number of other South American standards organizations, the award was accepted on his behalf by Vice Admiral G.F. Hussey, Jr, USN (Ret), managing director of ASA.

In presenting the award, Under Secretary of Labor James O'Connell, speaking on behalf of Secretary of Labor James T. Mitchell, called Mr Ainsworth "a man without whose active help we could never have held a President's Conference." He referred to his lifetime of experience and dedication, and commented "once many years ago he served on a committee to look into hazardous occupations for minors, and he did it so well that many of the recommendations were incorporated into hazardous occupations orders issued under the child labor provisions of the Fair Labor Standards Act."

The other recipients of the Award of Merit were Vincent P. Ahearn, managing director of the National Sand and Gravel Association, and Reed O. Hunt, president of Crown Zellerbach Corporation. Mr Ahearn served as executive director of the President's Conference on Occupational Safety for ten years, and in the 'thirties was executive director of the National Silicosis Conference organized by the Bureau of Labor Standards. Mr Hunt succeeds Mr Ahearn as executive director of the President's Conference and is credited with having brought about a reduction in the accident rate in the hazardous logging industry.

Vice Admiral G. F. Hussey, Jr, on behalf of Cyril Ainsworth, accepts Award of Merit from Under Secretary of Labor James O'Connell (right).

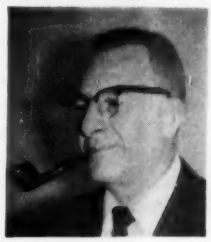
• "A MALIGNANCY – choking off product development and introduction of new building methods and materials. . . ." is the way *American Builder* magazine describes the multiple building codes situation. "There is no reason why builders should be forced to operate under as many as 40 or 50 codes in a given metropolitan area," the editorial continues. "It is a situation begging for a change—and reform can only come from within the industry. It must save itself."

The call for code action was made by Joseph B. Mason, editor of *American Builder*, in the August issue. "Multiple codes have hamstrung the industry's progress toward building better homes for less money," he says. Since attempts to write a single national code have bogged down, he suggests construction builders' best bet for solving code problems right now is adoption of one of the four model regional construction codes—BOCA (Building Officials Conference of America), National Building Code, Southern Standard Building Code, or Uniform Building Code, along with a model utility code. "Local adoption of one of the four model codes will yield workable uniformity on a regional basis," his editorial points out. "Later, the industry can work toward a unified national housing code."

Here is *American Builder's* blueprint for a code breakthrough:

"If you operate in an area plagued with multiple or obsolete codes . . . (1) Work through your local builder's group. Contact NAHB's (National Association of Home Builders) Code Committee in Washington, let them help formulate a local plan of action. (2) Familiarize yourself with the problem, and with model codes which might be suitable for your locality. (3) Organize a committee composed of builders, architects, plumbing and electrical contractors, representatives of the public—anyone who will benefit from adoption of a model code. (4) Conduct a survey of surrounding communities, try for total area participation. (5) Keep local government officials informed of what you are doing. (6) Enlist support of local press, Chamber of Commerce, PTA, and civic groups."

• LAWRENCE A. CARVEY has joined the staff of the American Standards Association, to work on safety standards. He will work with Henry Lamb, who for many years has been in charge of safety standards under ASA procedures and is secretary of the Safety Standards Board. Mr Lamb also has responsibility for work on highway traffic and nuclear standards, and is secretary of ASA's Company Member Conference.



Lawrence A. Carvey

Mr Carvey comes to ASA from the General Fire & Casualty Company where he had responsibility for safety engineering and applied accident prevention.

He attended Cooper Union School of Engineering in New York, followed by specialized courses in air conditioning engineering and allied fields. He also attended New York University, Center for Safety Education. He began his working career as a real estate maintenance manager, followed by an interval as design engineer in air conditioning, before taking up his work in accident prevention and safety engineering.

Mr Carvey is a member of the American Society of Safety Engineers, National Safety Council, Veterans of Safety, and is chairman of the Arrangements Committee for the 1961 Safety Convention, Greater New York Safety Council, to be held in New York City. He has served as chairman of the Audit Committee of the Metropolitan Chapter, American Society of Safety Engineers, and is a recent past president of the Safety Center Alumni of New York University. He is active as safety advisor to the Junior Achievement Program in Queens, and has lectured before Queens College adult classes on all phases of accident prevention.

• ORGANIZATION changes in its Washington laboratories have been announced by the National Bureau of Standards, in order to meet the needs of modern science and technology.

One of the important changes is organization of a new division, Instrumentation, with G. Franklin Montgomery as chief. This division comprises three sections from the Electricity and Electronics Division (Engineering Electronics, Electron Devices, and Electronic Instrumentation), a part of the Mechanical Instruments Section from the Mechanics Division, and the Basic Instrumentation Section, formerly the NBS Office of Basic Instrumentation. Joshua Stern has been named chief of the Basic Instrumentation Section.

The remaining five sections of the old Electricity and Electronics Division (Resistance and Reactance, Electrochemistry, Electrical Instruments, Magnetic Measurements, and Dielectrics) now make up the Electricity Division, with Dr C.H. Page as chief.

Another reorganized division, Metrology, has replaced the Optics and Metrology Division. A.G. McNish has been named chief of the new division, which contains all the sections of the old Division (Photometry and Colorimetry, Refractometry, Photographic Research, Length, and Engineering Metrology) plus the Mass and Scale Section and the Volumetry and Densimetry Section from the Mechanics Division.

The Mechanics Division has one new section, Pressure and Vacuum, of which Dr D.P. Johnson has been named chief.

In the Heat Division, the section on Thermodynamics has been disbanded, and four new sections have been estabished. The new sections are: Heat Measurements, Dr D.C. Ginnings, chief; Equation of State, Joseph Hilsenrath, chief; Statistical Physics, Dr M.S. Green, chief; and Molecular Spectroscopy, Dr D.E. Mann, chief.

Dr Alan D. Franklin has been named chief of the Mineral Products Division. He had been acting chief since November 1959, when he succeeded Dr Irl C. Schoonover, now the Bureau's Associate Director for Planning.

Dr Ugo Fano and William A. Wildhack have been named special assistants to the Director of the Bureau, and Dr K.E. Shuler has been named consultant to the Director. Dr Fano will continue his own research and will serve as consultant on the theoretical aspects of the Bureau's program. Mr Wildhack will keep the Director informed of the needs of

industry and other Government agencies for precision standards, calibration services, and measurement techniques, particularly those which require extension of NBS capabilities. Dr Shuler will advise the Director on matters connected with strengthening the scientific program at NBS. He will continue to undertake theoretical research in chemical physics.

From *Electrical World*,
August 22, 1960

Writing the Kilowhachacallit

To the Editor:

It is unfortunate that after about three-quarters of a century, there is still no uniformity on the method of writing the fundamental unit of our industry, the kilowatthour (some people use a hyphen) and its abbreviation.

"Kwhr," a logical combination of "kw" for (kilowatt) and "hr" (for hour) is used by many sources, such as the American Standards Association (Z10.1-1941) EEI [Edison Electric Institute], AIEE [American Institute of Electrical Engineers], and *Electrical World*.

On the other hand, the FPC [Federal Power Commission], many electric utilities, and other sources use "kwh" or "KWH" (sometimes with periods).

How about starting a campaign to make "kilowatthour," and its most sensible abbreviation "kwhr," the people's choice?

[signed] A. P. Vierheller
Union Electric Co
St. Louis 1, Mo

Electrical World Editor's comment: We would be pleased to see "kwhr" used universally. Wherever possible, it's our policy to use abbreviations accepted by the ASA and AIEE, and we believe others should do the same.

• CONVERSION tables are being made available to the textile industry in this country to help in converting the former systems of yarn numbering to the international "tex" system. This system was developed by the Technical Committee on Textiles, ISO/TC 38, of the International Organization for Standardization. Representatives of the U.S. textile industry took a leading role in this international work.

The new "tex" system is being offered for adoption as a single universal system for numbering yarns made

Imported Electrical Appliances—A Warning About Safe Use

Reprinted from the *BSI News*, published by the British Standards Institution

"THE POSSIBILITY of accidents arising through the use of imported electrical appliances with flexible cords having the earthing core colored red,[1] has for many years been recognized by the BSI.

"The Institution of Electrical Engineers recently issued a warning notice on this subject, following several recent instances of shock; many readers of *BSI News* will probably have read the extracts from this notice which were published in the national and trade press.

"The statement drew the urgent attention of vendors and users of imported domestic electrical apparatus, photographic and projection equipment, tape recorders, etc, to the risks which may ensue if the coding of the cores of the flexible cord with which such apparatus is furnished differs from the established British coding set out in the Institution's Regulations for the Electrical Equipment of Buildings, that is to say:

Green – earth connection
Red – phase (live) connection
Black – neutral connection

"The risk is most acute if the flexible cord provided with the apparatus has a core colored red which serves as its earth connection; because if the user, following established British practice, connects this core to the terminal of a British connecting plug which may itself be marked red, and then inserts the plug into a normal British socket, the result will be that any exposed metal parts of the imported apparatus connected to the red core will be charged at mains voltage, and represent a serious hazard.

"The attention of importers and wholesalers known to be handling foreign apparatus fitted with flexible cords which do not conform with British practice in respect of color coding has already been drawn by the Home Office Central Advisory Committee on Safety in the Home to this situation.

"Over three years ago, the British delegation attending meetings of the International Commission on Rules for the Approval of Electrical Equipment (usually known as the CEE) proposed that an attempt should be made to obtain international agreement on the use of green for identification of the earthing core in flexible cords.

"Such agreement has not, up to the present, been possible, as green is used in some countries as a phase color. The CEE has, however, recommended that the color combination green/yellow should be used for identifying the earthing core of flexible cords, and consideration is at present being given in Britain to the possibility of recognizing this color combination as an alternative to plain green. Practically all the other member-countries of the CEE have already indicated that within the next two or three years they will adopt the green/yellow combination either as their national standard or as an alternative thereto.

"The proposal has now been submitted by the CEE to the IEC (International Electrotechnical Commission) for consideration as a world-wide standard.

"There is thus the prospect that, in the not too distant future, 3-core flexible cords attached to imported electrical appliances will have the earthing core colored green/yellow, and the potentially dangerous situation due to the use of red for this core will be eliminated. Until this comes about, however, BSI fully endorses the statement made by the IEE."

[1] Editor's Note: U.S. practice uses green to indicate "earth" (ground) connection.

from any fiber. It is intended to replace the various yarn systems now in use—the English cotton counts, the French cotton counts, metric counts, Yorkshire woolen skeins, American woolen runs, English worsted counts. If so used, it will eliminate time spent in converting units from one system to the other and avoid mistakes that occur when technicians are forced to think in unfamiliar units.

A brochure, *Introduction of the Tex System for Designation of Yarn Number*, sponsored by ASTM Committee D-13 on Textiles, and the USA Committee for ISO/TC 38 on Textiles, L23, explains the background of the tex system and includes six tables of conversions from the various existing systems. The brochure is a reprint from an article published in the *ASTM Bulletin*, July, 1960. It was published by the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

Textile Industries, one of the outstanding trade papers in the textile field, has already taken steps to put the new system into use. Starting with its August issue, the tex number, in parentheses, will follow the usual designation wherever the yarn count is mentioned.

• THE INTERNATIONAL committees on shaft heights of machinery, ISO/TC 13, shaft ends, ISO/TC 14, couplings, ISO/TC 15, and keys and keyways, ISO/TC 16, held their first meetings in Brussels, June 20 to 23. The national standards associations of nine countries were represented: Belgium, Bulgaria, Czechoslovakia, France, Germany, Sweden, Switzerland, United Kingdom, Yugoslavia. Belgium holds the secretariat of all four committees.

Committee ISO/TC 13, Shaft heights of machinery, adopted a compromise solution for tolerances of parallelism, the only unsolved question on approval of a proposed ISO Recommendation, Shaft heights for driving and driven machines. This will include both a metric table and an inch table giving the direct conversion into inches of the values in millimeters. The United Kingdom has suggested that a number of inch values be added to the metric values expressed in inches. An inquiry is being made by the committee to determine whether it is appropriate to do so.

ISO Technical Committee 14, Shaft ends, adopted a series of diameters for a draft proposal on cylindrical shaft ends. Subject to further study, it also has prepared two series of lengths corresponding to the series of diameters.

The committee drafted directives on the basis of which the secretariat will draft a proposal relating to tapered shaft ends.

It was also suggested that a study be made of tapered shaft ends with internal threads, as well as of tapered ends with 1/5 taper.

ISO Technical Committee 15, Couplings, adopted a proposal for the secretariat to use as a basis for its work. This is to be supplemented with detailed values, which are to be elaborated by a group of experts.

ISO Technical Committee 16, Keys and keyways, adopted a series of sections for parallel keys, as well as corresponding tolerances. As regards keyways, the committee agreed to adopt sizes such that the bearing areas of the key should be equal in the shaft and in the hub and also agreed on the corresponding tolerances. The committee also agreed that the study of keys and keyways in inches should be undertaken.

The committee will continue its work by studying taper keys, Woodruff keys and tangential keys, as well as the specifications for the steels for keys.

AMERICAN STANDARDS

Just Published . . .

If your company is a member of the American Standards Association, it is entitled to receive membership service copies of these newly published American Standards. The ASA contact in your company receives a bimonthly announcement of new American Standards, which also serves as an order form. Find out who your ASA contact is and order your American Standards through him. He will make sure your company receives the service to which it is entitled.

ACOUSTICS, VIBRATION, AND MECHANICAL SHOCK

Characteristics of Auxiliary Equipment for Shock and Vibration Measurements, Method for Specifying, S2.4-1960 $0.80

Format for use by manufacturers for uniformity in indicating the characteristics of the subject equipment which may be a voltage amplifier, a power amplifier, a carrier system, a filtering circuit, or a combination of these components.

Sponsors: Acoustical Society of America; American Society of Mechanical Engineers

Criteria for Background Noise in Audiometer Rooms, S3.1-1960. $1.00

Criteria useful to the designer of rooms used for audiometric tests in planning appropriate acoustic treatment, and for the user to assure himself of sufficiently quiet test conditions.

Monosyllabic Word Intelligibility, Method for Measurement, S3.2-1960 $1.35

Describes procedures to be followed in conducting intelligibility tests which employ monosyllabic word lists. Specifies speech material and methods to be used in determining the relative measure of the effectiveness of different communication systems under the same specified conditions of use.

Sponsor: Acoustical Society of America

BUILDING AND CONSTRUCTION

Lime-Cement Stucco, Specifications for, A42.5-1960 $0.50

Specifications covering minimum requirements for lime-cement stucco, including mixtures of lime, portland cement, and aggregates, suitable bases on which they may be applied, and their proper application under average climatic and job-site conditions to assure permanence and minimum maintenance. Appendixes give general and technical information such as coordination of work and preparation of flashings.

Sponsors: American Society for Testing Materials; American Institute of Architects

DRAWINGS, SYMBOLS AND ABBREVIATIONS

American Drafting Standards Manual, Section 15, Electrical Diagrams, Y14.-15-1960 $1.50

Contains definitions and general information applicable to most of the commonly used electrical diagrams. Also included are detailed recommendations on preferred practices for use in the preparation of electrical diagrams.

Sponsors: American Society for Engineering Education; American Society of Mechanical Engineers

Metallizing Symbols, Y32.12-1960 $1.00

Graphical symbols used on drawings to indicate the extent and nature of metallizing operations (including surface preparation, spraying, etc).

Sponsors: American Society of Mechanical Engineers; American Institute of Electrical Engineers

ELECTRIC AND ELECTRONIC

Varnished Cloth Insulated Cables, Requirements for, C8.13-1960 (Revision of C8.13-1948) $2.00

Requirements for all sizes and classes of underground, aerial, and indoor power cables which are insulated with varnished cloth, used for transmission and distribution of electric energy.

Sponsor: Electrical Standards Board

PHOTOGRAPHY

Photographic Grade Sodium Acid Sulfate, Fused, Specifications for, PH4.105-1960 (Revision of PH4.105-1952) $0.35

Photographic Grade Paraformaldehyde, Specification for, PH4.153-1960 (Revision of PH4.153-1949) $0.35

Photographic Grade Sodium Ferrocyanide, Specification for, PH4.304-1960 $0.35

Physical and chemical properties to insure satisfactory use for photographic processing purposes.

Sponsor: Photographic Standards Board

PIPE AND FITTINGS

Dryseal Pipe Threads, B2.2-1960 (Partial revision of B2.1-1945, Pipe Threads) $3.50

Specifications, dimensions, and gaging for taper and straight dryseal pipe threads.

Sponsors: American Society of Mechanical Engineers; American Gas Association

Pressure-Temperature Ratings for Types 304L and 316L Flange Series, B16.5a-1960 (Addendum to B16.5-1957, Steel Pipe Flanges and Flanged Fittings)

Ratings for Non-Ferrous Wrought Flanges, B16.5b-1960 (Addendum to B16.5-1957, Steel Pipe Flanges and Flanged Fittings)

Pressure Temperature Ratings for Flanges Made of Aluminum Alloys, B16.5c-1960 (Addendum to B16.5-1957, Steel Pipe Flanges and Flanged Fittings) *In one volume* $1.00

Sponsors: American Society of Mechanical Engineers; Manufacturers Standardization Society of the Valve and Fittings Industry; Mechanical Contractors Association of America

Seamless Steel Boiler Tubes for High-Pressure Service, Specifications for, ASTM A 192-58T; ASA B36.14-1960 (Revision of ASTM A 192-55T; ASA B36.14-1956) $0.30

Covers seamless steel boiler tubes and superheater tubes ½ inch and larger in outside diameter.

Electric-Resistance-Welded Steel Boiler and Superheater Tubes for High-Pressure Service, Specifications for, ASTM A 226-58T; ASA B36.18-1960 (Revision of ASTM A 226-55T; ASA B36.18-1956) $0.30

Covers electric-resistance-welded steel boiler tubes and superheater tubes ½ inch and larger in outside diameter.

Seamless and Welded Ferritic Stainless Steel Tubing for General Service, Specifications for, ASTM A 268-58; ASA B36.36-1960 (Revision of ASTM A 268-55; ASA B36.36-1956) $0.30

Covers six grades of stainless steel tubing for general corrosion-resisting and high-temperature service.

Seamless and Welded Austenitic Stainless Steel Sanitary Tubing, Specifications for, ASTM A 270-58; ASA B36.-38-1960 (Revision of ASTM A 270-55; ASA B36.38-1956) $0.30

Covers a grade of seamless and welded austenitic stainless steel sanitary tubing for use in the dairy and food industry, in sizes up to 4 inches outside diameter. Tubes are furnished with surface finish as specified.

Sponsors: American Society for Testing Materials; American Society of Mechanical Engineers

In Process . . .

As of September 20, 1960

Standards Council gives final approval to American Standards. Board of Review acts for Standards Council (takes about 2 weeks). Standards Board approves standards to send to Board of Review or Standards Council (takes about 4 weeks).

ACOUSTICS, VIBRATION, AND MECHANICAL SHOCK

In Board of Review

Electroacoustical Characteristics of Hearing Aids, Methods for Measurement, S3.3- (Revision of Z24.14-1953)

Sponsor: Acoustical Society of America

CINEMATOGRAPHY

American Standards Approved

Transmission Density of Motion-Picture Films, Method of Determining, PH22.-27-1960 (Revision of PH22.27-1947)

Reel Spindles for 16mm Motion-Picture Projectors, PH22.50-1960 (Revision of PH22.50-1946)

9-kc Sound Focusing Test Film for 35mm Motion-Picture Sound Reproducers, PH22.62-1960 (Revision of PH22.62-1948)

1000-Cycle Balancing Test Film for 35mm Motion-Picture Sound Reproducers, PH22.67-1960 (Revision of PH22.67-1948)

Sponsor: Society of Motion Picture and Television Engineers

In Standards Board

Cross-Modulation Tests for 16mm Variable-Area Photographic Sound Prints, PH22.52- (Revision of PH22.52-1954)

Sound Records and Scanning Area of Double Width Push-Pull Sound Prints, Normal Centerline Type, PH22.69-(Revision of PH22.69-1948)

Sound Records and Scanning Area of Double Width Push-Pull Sound Prints, Offset Centerline Type, PH22.70- (Revision of PH22.70-1948)

Spectral Diffuse Density of Photographic Sound Record on Three-Component Subtractive Color Films, PH22.117-

Dimensions for 65mm Motion-Picture Film, KS-1870, PH22.118-

Dimensions for 70mm Motion-Picture Film, Perforated 65mm, KS-1870, PH22.119-

Sponsor: Society of Motion Picture and Television Engineers

ELECTRIC AND ELECTRONIC

In Board of Review

Specialty Transformers, Requirements and Terminology for, C89.1- (Revision of C89.1-1957)
Sponsor: National Electrical Manufacturers Association

In Standards Board

Interrupting Rating Factors for Reclosing Service Power Circuit Breakers, C37.7- (Revision of C37.7-1952)

Reaffirmation Being Considered

Rated Control Voltages and their Ranges, for Power Circuit Breakers, C37.8-1952
Sponsor: Electrical Standards Board

GAS-BURNING APPLIANCES

American Standard Approved

Approval Requirements for Central Heating Gas Appliances, Volume II, Gravity and Forced Air Central Furnaces, Z21.13.2-1960 (Revision of Z21.13.2-1958, Z21.13.2a-1959, Z21.13.2b-1960)
Sponsor: American Gas Association

MECHANICAL

American Standards Approved

Ball and Roller Bearings and Their Parts, Terminology and Definition, B3.7-1960

Bearing Mounting Accessories, Specifications for, B3.9-1960 (Revision of B3.9-1951)
Sponsor: Anti-Friction Bearing Manufacturers Association

In Board of Review

Tolerances for Ball and Roller Bearings, B3.5- (Revision of B3.5-1951)

Bearing Mounting for Ball and Roller Bearings, Specifications for, B3.8- (Revision of B3.8-1951)
Sponsor: Anti-Friction Bearing Manufacturers Association

In Standards Board

Gaging Practices for Ball and Roller Bearings, B3.4- (Revision of B3.4-1950)
Sponsor: Anti-Friction Bearing Manufacturers Association

MINING

American Standard Approved

Rock Dusting Underground Bituminous Coal and Lignite Mines to Prevent Coal Dust Explosions, M13.1-1960 (Revision of M13-1925)
Sponsor: Bureau of Mines

NUCLEAR ENERGY

In Standards Board

Radiation Protection in Uranium Mines and Mills (Concentrators), N7.1-
Sponsors: Atomic Industrial Forum; National Safety Council

PIPE AND FITTINGS

American Standards Approved

Addendum B31.1a-1960 to American Standard Code for Pressure Piping, B31.1-1955

Addendum B31.3a-1960 to American Standard Petroleum Refinery Piping, B31.3-1959

Addendum B31.4a-1960 to American Standard Oil Transportation Piping, B31.4-1959

Addendum B31.8a-1960 to American Standard Gas Transmission and Distribution Systems, B31.8-1958
Sponsor: American Society of Mechanical Engineers

REFRIGERATION

American Standard Approved

Number Designation of Refrigerants, B79.1-1960
Sponsor: American Society of Refrigerating Engineers

SAFETY

American Standard Approved

Safety Code for Elevators, Dumbwaiters, and Escalators, A17.1-1960 (Revision of A17.1-1955 and A17.1a-1957)
Sponsors: American Institute of Architects; American Society of Mechanical Engineers; National Bureau of Standards

In Standards Board

Safety Requirements for Storage and Handling of Anhydrous Ammonia, K61.1-
Sponsor: Compressed Gas Association

AMERICAN STANDARDS PROJECTS

Bolts and Nuts, B18—

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Correction

The publisher has called attention to a number of typographical errors in American Standard Square and Hexagon Bolts and Nuts, B18.2-1960. If you have already received your copy, please make the following corrections:

Page 8 Change first line of asterisk note as follows: "There may be a reasonable swell or fin under the head or die seam on the body not to exceed the nominal body diameter by the following:"

Page 13 Transpose the values in last two columns of table (Max., Min Radius of Fillet).

Page 15 Column 6: Change title to "Root Diameter D1."

Page 15 Detail of thread form (lower right-hand figure): Change "R" to "D1" and reverse dimension line with arrow pointing up rather than down.

Page 15 End of footnote starting "Minimum thread length . . ."; Change "practical" to "practicable."

Page 17 Under Nominal "Thickness Jam Nuts", sixth line: Change "6/16" to "5/16".

Page 21 Third line, fourth column: Change "0.5265" to "0.5625."

Page 22 Last line of asterisk note: Change "page 18" to "page 17."

Page 23 First line in the break of the table: Change "page 18" to "page 17." Asterisk note: Change "page 18" to "page 17."

Page 24 First line in the break of the table: Change "page 19" to "page 18". Asterisk note: Change "page 19" to "page 18."

Page 29 In the "Heavy Bolts" column add "2-3/4" for a nominal size of wrench of 4-1/4. In the "Finished Bolts" column add "3-1/4" for a

nominal size of wrench of 4-7/8. Transpose the following sizes from the "Heavy Nuts" column to the "Finished and Regular Bolts" column:

3-1/2, for a nominal size of wrench of 5-1/4.

3-3/4, for a nominal size of wrench of 5-5/8.

4, for a nominal size of wrench of 6.

Page 33 Appendix III: Delete both paragraphs. Change "Screw" to "Bolt" in D and L on both figures.

R. E. Birr

Motion Pictures, PH22—

Sponsor: Society of Motion Picture and Television Engineers

R. E. Birr, recently named chairman of Sectional Committee PH22, reports that plans of the committee for the immediate future revolve about two important areas. The first is in the domestic area and involves updating standards of the PH22 series on motion pictures and introducing new ones as required. The second area is that of international standardization being carried out in ISO/TC 36 on Cinematography. ASA serves as Secretariat for this international committee with PH22 as technical advisors. These two areas require a slightly different approach, Mr Birr explains; for example, international standards have a different dimensional scale (the metric system is basic). Then, too, brevity assumes a greater importance because of the need for numerous language translations.

"The motion picture and television industry has recognized the urgent need for standardization of films, many equipment components, and measurement methods to assure interchangeability and usability of its products, not only within the United States, but throughout the world as well," Mr Birr points out. "PH22 committee efforts will be directed toward not only older, well established products, but some of the newer components which are being manufactured and used by an ever increasing number of firms and individuals both here and abroad."

Mr Birr received his B.S. in electrical engineering from the University of Illinois. He joined the General Electric Lamp Division after service in the Army Air Corps during World War II and is now engaged in product planning in the Photo Lamp Department. Mr Birr is a Fellow of the Society of Motion Picture and Television Engineers, and a member of the Society of Photographic Scientists and Engineers, the Optical Society of America, the Illuminating Engineering Society, and the Cleveland Engineering Society.

American Standard

Identification Code for Ball and Roller Bearings

ASA
Reg. U. S. Pat. Off.
B54.1-1960

UDC 621.822.7/.8-777.1

Errata

In Table 4, page 10, the description for Code BINT should be changed to read:

Separable inner ring, nominal contact angle, over 10 to 22 degrees inclusive. Inch dimensions.

In the third paragraph of Section 3 on page 7, the statement has been made that the letter "I" is never used. Actually, the letter "I" is sometimes used where there is no possibility of mistaking it for the numeral one; namely, in codes of three letters or more where the "I" is intermediate.

September 16, 1960

James R. Cox

Acoustics, S1—

Sponsor: Acoustical Society of America

J. R. Cox, Jr, formerly vice-chairman of this committee, became chairman recently, with Robert B. Watson as vice-chairman. Dr Cox is head of the Acoustics Laboratory, Central Institute for the Deaf, St. Louis, Mo. He is also associate professor of electrical engineering at Washington University, where he teaches courses in acoustics. Mr Cox succeeds A.P.G. Peterson.

Dr Watson, the committee's new vice-chairman, is chief of the Physics and Engineering Branch, Physical Sciences Division, Army Research Office. A graduate of the University of Illinois, with an M.A. from the University of California, and a Ph. D. from Harvard University, Mr Watson spent several years as research associate with the Harvard Underwater Sound Laboratory. He was associate professor in the Department of Physics at the University of Texas before accepting his present assignment.

Dr Watson is a Fellow of the Acoustical Society of America and of the American Association for the Advancement of Science, and a member of several honorary societies as well as professional societies. He is also a member of ASTM Committee C-20, Acoustical Materials.

Sectional Committee S1 is an active committee which has a number of writing groups proceeding at this time. The projects cover a wide range of subjects in the field of acoustics.

Commendation "for the tremendous effort he has put forth in revising the acoustical terminology" has been voted by the committee to Dr Robert W. Young, chairman of the writing group that prepared the revision of American Standard S1.1-1960. Dr Young is with the U.S. Navy Electronics Laboratory, San Diego, California.

"We hope that you will receive some partial recompense in the realization that the American Standard

Robert B. Watson

Acoustical Terminology (Including Mechanical Shock and Vibration), S1.1-1960, will be widely circulated and used," the letter to Dr Young comments. "It will be of inestimable value to both the fledgling and expert acoustician, as well as to those lay people seeking definitions of particular acoustical terms."

The revised standard is now being published and copies are expected within the next couple of months.

Charles E. Crede

Mechanical Shock and Vibration, S2—

Sponsors: Acoustical Society of America; American Society of Mechanical Engineers

Former vice-chairman C. E. Crede has succeeded H. M. Trent as chairman of Sectional Committee S2, with Irwin Vigness as new vice-chairman. Mr Crede is with the Division of Engineering, California Institute of Technology, Pasadena, California. Dr Vigness is head of the U.S. Naval Research Laboratory's Shock and Vibration Branch, Anacostia Station, Washington, D.C.

Mr Crede has recently become affiliated with the California Institute of Technology, having been vice-president of Barry Controls at the time he was named vice-chairman of Sectional Committee S2. He is a member of the Society for Experimental Stress Analysis, the Acoustical Society of America, and the American Society for Engineering Education.

Dr Vigness received his bachelor's and master's degrees from the Electrical Engineering Department of the University of Minnesota and his doctorate from the University's Department of Physics. He has been associated with the U.S. Naval Research Laboratory since 1939, where he has worked principally on problems relating to instrumentation, stress analyses, and shock and vibration.

On his retirement from the chairmanship, Mr Trent wrote the committee members: "There is no need for me to convince you of the importance of the work you are doing both within our own country and internationally." The committee voted its appreciation of "the great effort and statesmanship which Mr Trent has displayed during his tenure as chairman."

In addition to completion of the

Irwin Vigness

American Standard S2.2-1959, Calibration of Shock and Vibration Pickups, and American Standard S2.4-1960, Characteristics of Auxiliary Equipment for Shock and Vibration Measurements, the following standards are nearing completion by this committee: Specification for the Design, Construction, and Operation of Variable Duration Medium-Impact Shock-Testing Machine for Lightweight Equipment, S2.1, and Specification for High-Impact Shock Machine for Electronic Devices, S2.3, and Performance of Vibration Machines, S2.5.

Work on other subjects is under way in the committee's writing groups.

In order to maintain uniformity of definitions in the "S" standards, a committee to coordinate the terminology used by the "S" committees is being organized under the jurisdiction of the Acoustical Standards Board. Committee S2 has urged that quick action be taken to put this plan into operation.

Karl D. Kryter

Bioacoustics, S3—

Sponsor: Acoustical Society of America

Recently named chairman of Sectional Committee S3, Karl D. Kryter of Bolt Beranek and Newman, Inc, Cambridge, Mass., succeeds Professor W. D. Neff of the University of Chicago. Dr Henning E. von Gierke, Yellow Springs, Ohio, is vice-chairman.

Dr Kryter's training is in the field of physiological psychology, with an A.B. from Butler University, Indianapolis, Indiana, and a Ph. D. from the University of Rochester, Rochester, N.Y. He was a Fellow at the Harvard Psycho-Acoustic Laboratory, 1942-46, and professor of psychology at Washington University, St. Louis, until he became director of the Human Factors Operations Research Laboratory, U.S. Air Force, 1948-1957. Dr Kryter has been research psychologist at Bolt Beranek and Newman, Inc, since 1957. He has also been a member of the Advisory Panel on Psychology, U.S. Department of Defense, since 1958.

Dr Kryter is a member of the National Research Council-Armed Services Committee on Hearing and Bio-Acoustics, and is a Fellow of the Acoustical Society of America. He is also a member of the American Psychological Association, the American Association for the Advancement of Science, and the Human Factors Society. His principal fields of research are in psycho-acoustics, hearing, and speech communication.

Dr Kryter reports that Sectional Committee S3 has writing groups working on loudness computation, audiometers, methods of calculating speech intelligibility, and coupler calibration of earphones.

NEW!

ACOUSTICAL STANDARDS, 1960

Up-to-date technical data—for reproducible and comparable measurements, to improve hearing, for calibration of equipment—in these 6 American Standards published in 1960

NOW AVAILABLE

• For reproducible and comparable measurements

American Standard Preferred Frequencies for Acoustical Measurements
S1.6-1960 ..... $0.35

Sponsor: Acoustical Society of America

Selected frequencies recommended for acoustical measurements to facilitate comparison of results and encourage standardization of measuring equipment.

American Standard Calibration of Shock and Vibration Pickups
S2.2-1959 ..... $2.50

Sponsors: Acoustical Society of America; American Society of Mechanical Engineers

General principles for calibration of shock and vibration pickups, and methods of calibration which give reliable and reproducible results for accurately measuring the shocks and vibrations to which aircraft, missiles, and other high performance equipment are subject in service.

American Standard Method of Specifying Characteristics of Auxiliary Equipment for Shock and Vibration Measurements
S2.4-1960 ..... $0.80

Sponsors: Acoustical Society of America; American Society of Mechanical Engineers

Format to help manufacturers report uniformly on the characteristics of this equipment, which may be a voltage amplifier, a power amplifier, a carrier system, a filtering circuit, or a combination of these components.

• For calibration of recording equipment

American Standard Methods of Calibration of Mechanically Recorded Lateral Frequency Records
S4.1-1960 58 IRE 19.S1 ..... $0.60

Sponsor: Institute of Radio Engineers

Three basic methods for calibrating laterally modulated frequency records used for calibrating recording systems and recording heads which are available commercially for testing phonograph pickups and reproducing systems.

• To improve hearing

American Standard Criteria for Background Noise in Audiometer Rooms
S3.1-1960 ..... $1.00

Sponsor: Acoustical Society of America

Criteria for the sound pressure level of background noise in a room used for audiometric tests. Such criteria make it possible for the designer to plan appropriate acoustic treatment and for the user to assure himself of sufficiently quiet test conditions. Criteria are stated in physical terms, but are based upon psychophysical data.

American Standard Method for Measurement of Monosyllabic Word Intelligibility
S3.2-1960 ..... $1.35

Sponsor: Acoustical Society of America

Procedures to be followed in intelligibility tests which employ monosyllabic word lists. Gives key words to be used and outlines test procedures for determining the relative effectiveness of different communication systems.

Order Copies of these 1960 Acoustical Standards from

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